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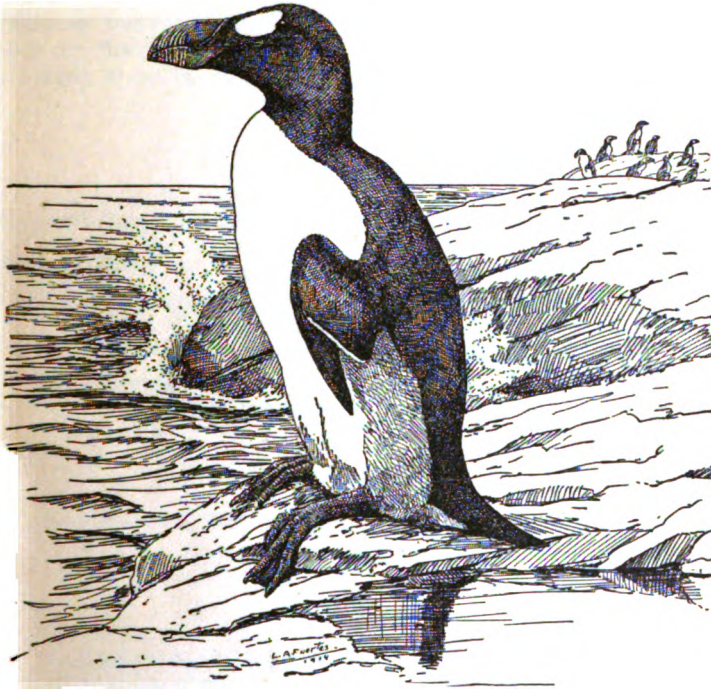
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OLD SERIES, } CONTINUATION OF THE { NEW SERIES,
VOL. XLVI. } BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB { VOL. XXXVIII.

The Auk

A Quarterly Journal of Ornithology

EDITOR
WITMER STONE



VOLUME XXXVIII

PUBLISHED BY
The American Ornithologists' Union

LANCASTER, PA.
1921

Entered as second-class mail matter in the Post Office at Lancaster, Pa.
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ANTHONY, A. W., Ironside, Ore.	(1885) 1895 ²
BANGS, OUTRAM, Museum Comp. Zoology, Cambridge, Mass.	(1884) 1901
BARROWS, PROF. W. B., Box 1047, East Lansing, Mich.	1883
BATCHELDER, CHARLES F., 7 Kirkland St., Cambridge, Mass.	Founder
BEEBE, C. WILLIAM, New York Zool. Park, New York, N. Y.	(1897) 1912
*BENT, ARTHUR CLEVELAND, Taunton, Mass.	(1889) 1909
*BICKNELL, EUGENE P., 30 Pine St., New York, N. Y.	Founder
BISHOP, DR. LOUIS B., 356 Orange St., New Haven, Conn.	(1885) 1901
BROWN, NATHAN CLIFFORD, 218 Middle St., Portland, Me.	Founder
CHADBOURNE, DR. ARTHUR P., The Copley-Plaza, Boston, Mass.	(1883) 1889
CHAPMAN, DR. FRANK M., Amer. Mus. Nat. Hist., New York, N. Y.	(1885) 1889
*CORY, CHARLES B., Field Museum Nat. Hist., Chicago, Ill.	Founder
DEANE RUTHVEN, 112 W. Adams St., Chicago, Ill.	1883
DWIGHT, DR. JONATHAN, 43 W. 70th St., New York, N. Y.	(1883) 1886
FISHER, DR. ALBERT K., Biological Survey, Washington, D. C.	Founder
FLEMING, JAMES H., 267 Rusholme Road, Toronto, Ontario	(1893) 1916
FORBUSH, EDWARD H., State House, Boston, Mass.	(1887) 1912
FUERTES, LOUIS A., Cornell Heights, Ithaca, N. Y.	(1891) 1912
GRINNELL, DR. GEORGE BIRD, 238 E 15th St., New York, N. Y.	1883
GRINNELL, DR. JOSEPH, Mus. Vert. Zool., Univ. Calif., Berkeley, Calif.	(1894) 1901
JONES, LYND, Spear Laboratory, Oberlin, Ohio	(1888) 1905
LOOMIS, LEVERETT M., Cal. Acad. Sci., San Francisco, Calif.	(1883) 1892
LUCAS, DR. FREDERIC A., Am. Mus. Nat. Hist., New York, N. Y.	(1888) 1892
MAILLIARD, JOSEPH, 1815 Vallejo St., San Francisco, Calif.	(1895) 1914
MCATEE, WALDO LEE, Biological Survey, Washington, D. C.	(1903) 1914
*MCGREGOR, RICHARD C., Bureau of Science, Manila, P. I.	(1889) 1907
MERRIAM, DR. C. HART, 1919 16th St., N. W. Washington, D. C.	Founder
MILLER, W. DEWITT, Am. Mus. Nat. Hist., New York, N. Y.	(1896) 1914

¹ Members of the Union, and subscribers to THE AUK are requested to promptly notify DR. WITMER STONE, Acad. Nat. Sciences, Philadelphia, Pa., of any change of address.

² Dates in parentheses indicate dates of joining the Union.

- MURPHY, DR. ROBERT C., Amer. Mus. Nat. Hist., New York, N. Y.
(1905)1920
- NEHRLING, H., Gotha, Fla.....1883
- NELSON, DR. E. W., Biological Survey, Washington, D. C.....1883
- OBERHOLSER, DR. HARRY C., Biol. Survey, Washington, D. C. (1888)1902
- OSGOOD, DR. WILFRED H., Field Museum Nat. Hist., Chicago, Ill.
(1893)1905
- *PALMER, DR. T. S., 1939 Biltmore St., N. W. Washington, D. C.(1888)1901
- PALMER, WILLIAM, U. S. National Museum, Washington, D. C..(1888)1898
- RICHMOND, DR. CHARLES W., U. S. Nat. Museum, Washington, D. C.
(1888)1897
- RIDGWAY, ROBERT, U. S. Nat. Mus., Washington, D. C.....Founder
- RILEY, JOSEPH H., U. S. Nat. Mus., Washington, D. C.....(1897)1919
- ROBERTS, DR. THOMAS S., Univ. of Minnesota, Minneapolis, Minn..1883
- *SAGE, JOHN H., Portland, Conn.....1883
- SAUNDERS, WILLIAM E., 240 Central Ave., London, Ontario.....1883
- SHUFELDT, DR. ROBERT W., 3356 18th St., N. W., Washington, D. C.
Founder
- STONE, DR. WITMER, Acad. Nat. Sciences, Philadelphia, Pa....(1885)1892
- SWARTH, HARRY S., Mus. Vert. Zoology, Univ. of California, Berkeley, Calif.....(1900)1916
- TAVERNER, PERCY A., Victoria Memorial Museum, Ottawa, Canada
(1902)1917
- TODD, W. E. CLYDE, Carnegie Museum, Pittsburgh, Pa.....(1890)1916
- WETMORE, DR. ALEXANDER, Biol. Survey, Washington, D. C..(1908)1919
- WIDMANN, OTTO, 5105 Enright Ave., St. Louis, Mo.....1884

RETIRED FELLOWS.

- FISHER, PROF. W. K., Hopkins Marine Sta., Pacific Grove, Cal..(1899)1920
- HENSHAW, HENRY W., The Ontario, Washington, D. C.....(1883)1918
- LAWRENCE, NEWBOLD T., Lawrence, N. Y.....(1883)1913
- STEJNEGER, DR. LEONHARD, U. S. Nat. Mus., Washington, D. C.(1883)1911

HONORARY FELLOWS.

- BAKER, E. C. STUART, Chief Police Office, West India Docks, London,
E. 14, England.....(1918)1920
- BUTURLIN, SERGIUS ALEXANDROVICH, Wesenberg, Esthonia, Russia.
(1907)1916
- DABBENE, DR. ROBERTO, Museo Nacional, Buenos Aires, Argentina
(1916)1918
- DUBOIS, DR. ALPHONSE, Villa Rayon de Soleil, Coxyde sur Mer, Belgium.....(1884)1911

- EVANS, ARTHUR HUMBLE, 9 Harvey Road, Cambridge, England
(1899)1917
- GADOW, DR. HANS FRIEDRICH, Cleramendi, Great Shelford, near
Cambridge, England.....(1884)1916
- HAAGNER. ALWYN KARL, Zoological Gardens, Box 754, Pretoria,
Transvaal, South Africa.....(1916)1918
- HARTERT, DR. ERNST J. O., Zoological Museum, Tring, Herts, Eng-
land.....(1891)1902
- HELLMAYR, DR. CARL E., Neuhauserstrasse 51.II, Munich, Germany.
(1903)1911
- IHERING, DR. HERMANN VON, Director Museo Nacional, Peru 208,
Buenos Aires, Argentina.....(1902)1911
- LÖNNBERG, DR. A. J. EINAR, Naturhistoriska Riksmuseum, Veten-
skapsakademien, Stockholm, Sweden.....(1916)1918
- LOWE, DR. PERCY R., Brit. Mus. (Nat. Hist.), Cromwell Road, Lon-
don, S. W. 7, England.....(1916)1920
- MÉNÉGAUX, DR. HENRI AUGUSTE, Museum d'Histoire Naturelle, 55
Rue de Buffon, Paris, France.....(1916)1918
- PYCRAFT, WILLIAM PLANE, British Museum (Nat. Hist.) Cromwell
Road, London, S. W., 7, England.....(1902)1911
- REICHENOW, DR. ANTON, Königl. Mus. für Naturkunde, Invaliden-
strasse, 43, Berlin.....(1884)1891
- ROTHSCHILD, LORD LIONEL WALTER, Zoological Museum, Tring,
Herts, England.....(1898)1913
- SALVADORI, COUNT TOMMASO, Royal Zool. Museum, Turin, Italy.....1883
- SCHALOW, PROF. HERMAN, Hohenzollerndamm 50, Berlin-Grünwald,
Germany.....(1884)1911
- SCLATER, WM. LUTLEY, 10 Sloane Court, Chelsea, London, S. W. 1.
England.....(1906)1917
- SUSCHKIN, DR. PETER, University, Kharkov, Russia.....(1903)1918
- VAN OORT, DR. E. D., Mus. Nat. Hist., Leyden, Holland.....(1913)1919

CORRESPONDING FELLOWS.

- ABBOTT, DR. WILLIAM L., 400 S. 15th St., Philadelphia, Pa.....1916
- ALFARO, DON ANASTASIO, San José, Costa Rica.....1888
- ALPHÉRAKY, SERGIUS N., Imperial Acad. Sci., Petrograd, Russia.....1913
- ARRIBALZA, ENRIQUE LYNCH, Resistencia, Chaco, Argentina.....1918
- ARRIGONI DEGLI ODDI, COUNT ETTORE, Univ. of Padua, Padua, Italy1900
- ASHBY, EDWIN, Wittunga, Blackwood, Adelaide, South Australia....1918
- BANNERMAN, DAVID ARMITAGE, 6 Palace Gardens Terrace, Kensing-
ton, London, W. 8, England.....1916

BATE, Miss DOROTHEA M. A., Bassenden House, Gordon, Berwickshire, Scotland.....	1920
BATES, GEO. LATIMER, Bitye, via Yaunde, Cameroon, W. Africa.....	1919
BAXTER, Miss EVELYN VIDA, The Grove, Kirkton of Largo, Fifeshire, Scotland.....	1919
BEDDARD, FRANK EVERS, Zoöl. Society of London, London, England.....	1917
BERTONI, Dr. ARNOLDO de WINKELREID, Puerto Bertoni, Paraguay..	1919
BIANCHI, Dr. VALENTINE, Imperial Zoöl. Museum, Petrograd, Russia.....	1916
BLAAUW, FRANS ERNST, Goorlust 'sGraveland, Helversum, Holland.....	1920
BONHOTE, JOHN LEWIS, Park Hill House, Charleston, England.....	1911
BUREAU, Dr. LOUIS, École de Médecine, Nantes, France.....	1884
BÜTTIKOFER, Dr. JOHANNES, Zoölogical Garden, Rotterdam, Holland.....	1886
CAMPBELL, ARCHIBALD James, "Bulgaroo," Broughton, R'd, Surrey Hills, Victoria, Australia.....	1902
CARRIKER, M. A., Jr., Apartado 51, Santa Marta, Colombia... (1907).....	1912
CHAMBERLAIN, MONTAGUE, Cambridge, Mass..... (Founder)	1901
CHUBB, CHARLES, British Museum (Nat. Hist.) Cromwell Road, London, S. W., 7, England.....	1911
CLARKE, WILLIAM EAGLE, Royal Scottish Museum, Edinburgh.....	1889
COLLINGE, Dr. WALTER E., The Museum, York, England.....	1918
DALGLEISH, JOHN J., Brankston Grange, Bogside Station, Alloa, Scotland.....	1883
DELACOUR, JEAN, Chateau de Cleres, Seine Inférieure, France.....	1920
DOLE, SANFORD B., Honolulu, Hawaii.....	1883
ECHT, ADOLPH BACHOFEN VON, Nussdorf, near Vienna, Austria.....	1883
FEILDEN, Col. HENRY WEMYSS, Burwash, Sussex, England.....	1884
FERRARI-PEREZ, Prof. FERNANDO, Tacubaya, D. F., Mexico.....	1885
FREKE, PERCY EVANS, South Point, Limes Road, Folkstone, England.....	1883
GEE, NATHANIEL GIST, Summerton, S. C.....	1919
GODWIN-AUSTEN, Lieut.-Col. HENRY HAVERSHAM, Nore, Hascombe, Godalming, Surrey, England.....	1884
GRANDIDIER, ALFRED, 6 Rond-Point des Champs Elysées, Paris.....	1883
GRANT, Major CLAUDE HENRY BAXTER, 2 Lebanon Gardens, West Hill, Wandsworth, London, S. W. 18, England.....	1920
GURNEY, JOHN HENRY, Keswick Hall, Norwich, England.....	1883
GYLDENSTOLPE, Count NILS, Naturhistoriska Riksmuseum, Vetenskapsakademien, Stockholm, Sweden.....	1918
HALL, ROBERT, Tasmanian Museum, Hobart, Tasmania.....	1916
HARTING, JAMES EDMUND, Portmore Lodge, Weybridge, Surrey, England.....	1883
HAVILAND, Miss MAUD D., Old Hall, Newnham College, Cambridge, England.....	1920
HELMS, Dr. O., Sanatoriet ved Nakkebøllefjord pr Pejruk, Denmark.....	1920
HENNICKE, Dr. CARL R., Gera, Reuss, Germany.....	1907

HENSON, HARRY V., Yokohama, Japan.....	1888
HUDSON, WILLIAM HENRY, Tower House, St. Luke's Road, West- bourne Park, London, W. England.....	1895
HULL, ARTHUR FRANCIS BASSETT, Box 704, Sydney, N. S. W.....	1919
INGRAM, Capt. COLLINGWOOD, Forest House, Westgate-on-Sea, Kent, England.....	1920
IREDALE, TOM, 39 Northcote Ave., Ealing, London, W. 5, England...	1918
JACKSON, Miss ANNIE C., Swordale, Evanton. Ross-shire, Scotland....	1919
JOURDAIN, Rev. FRANCIS C. R., Appleton Rectory, Abingdon, Berks, England.....	1918
KLOSS, CECIL BODEN, Kuala Lumpur, Federated Malay States.....	1918
KRÜPER, Dr. THEOBALD J., University Museum, Athens, Greece.....	1884
KURODA, NAGAMICHI, Fukuyoshi Cho, Akasaka, Tokyo, Japan.....	1918
LEACH, Dr. JOHN ALBERT, Eyrecourt, Canterbury, Victoria, Australia	1919
LE SOUËF, DUDLEY, Zoological Gardens, Melbourne, Australia.....	1911
MADÁRASZ, Dr. JULIUS VON, Matyas Sir 14, Budapest, Hungary.....	1884
MATHEWS, GREGORY M., Foulis Court, Fair Oak, Hants, England...	1911
MENZBIER, Prof. Dr. MICHAEL, University for Women, Devitchje, Pola, Moscow, Russia.....	1884
MILLAIS, JOHN GUILLE, Compton's Brow, Horsham, Sussex, England	1911
MITCHELL, Dr. P. CHALMERS, Zoological Society, Regents Park, Lon- don, N. W. 8, England.....	1919
MOFFETT, LACY I., 5 Quinsan Gardens, Shanghai, China.....	1919
NICHOLSON, FRANCIS, Ravenscroft, Windermere, Westmoreland, Eng- land.....	1884
NICOLL, MICHAEL JOHN, Valhalla House, Zoöl. Gardens, Giza, Egypt	1919
OGILVIE-GRANT, WILLIAM ROBERT, British Museum (Nat. Hist.), Cromwell Road, London, S. W. 7, England.....	1899
PHILLIPS, MONTAGU AUSTIN, Devonshire House, Reigate, Surrey, England.....	1919
RAMSDEN, Dr. CHARLES T., Box 146, Guantanamo, Cuba.....	(1912)1918
RINGER, FREDERIC, Nagasaki, Japan.....	1888
RINTOUL, Miss LEONORE JEFFREY, Lahill Largo, Fifeshire, Scotland..	1919
ROBERTS, AUSTEN, Pretoria, South Africa.....	1920
ROBINSON, HERBERT C., Selangor State Museum, Kuala Lumpur, Federated Malay States.....	1918
SHÖLER, Dr. E. LEHN, Uraniavej 14-16, Copenhagen, Denmark.....	1920
SETH-SMITH, DAVID, 34 Elsworthy Road, South Hampstead, London, N. W. 3, England.....	1920
SNOUKAERT VON SCHAUBURG, Baron RENÉ C. E. G. J. van, Doorn, Holland.....	1920
SNETHLAGE, Dr. EMILIA, Museu Goeldi, Pará, Brazil.....	1915
SWANN, H. KIRKE, 38 Great Queen St., Kingsway, London, W. C. 2, England.....	1919

SWYNNERTON, C. F. M., Poste Restante, Dar-es-Salaam, German East Africa.....	1918
THEBL, DR. JOHAN HJALMAR, University of Upsala, Upsala, Sweden.....	1884
TICEHURST, N. F., 24 Pevensey Road, St. Leonards-on-Sea, England.....	1918
TSCHUSI 2U SCHMIDHOFFEN, VICTOR, RITTER VON, Villa Tännenhof, bei Hallein, Salzburg, Austria.....	1884
TURNER, Miss EMMA L., Langton Close, Girton, Cambridge, England.....	1920
UCHIDA, SEINOSUKE, No. 1, 1-chome Kitamachi, Aoyama, Tokyo, Japan.....	1919
WATERHOUSE, F. H., Zoöl. Soc. of London, Regents' Park, London, N. W. 8, England.....	1889
WHITE, HENRY LUKE, Belltrees, Scone, New South Wales.....	1920
WHITE, Capt. SAMUEL ALBERT, Wetunga, Fulham, South Australia.....	1919
WINGE, Dr. HERLUF, Univ. Zoöl. Museum, Copenhagen, Denmark.....	1903
WITHERBY, HARRY FORBES, 12 Chesterfield Gardens, Hampstead, London, N. W. 3, England.....	1916
WORCESTER, Prof. DEAN C., Manila, P. I.....	1903
ZELEDON, Don JOSÉ C., San José, Costa Rica.....	1884

MEMBERS.

*Life Members

ALLEN, ARTHUR A., McGraw Hall, Cornell Univ., Ithaca, N. Y..	(1909)1914
ALLEN, FRANCIS H., 4 Park St., Boston, Mass.....	(1888)1901
ALLEN, Dr. GLOVER M., 234 Berkeley St., Boston, Mass.....	(1896)1904
ANDERSON, Dr. R. M., Mus. Geol. Survey, Ottawa, Canada.....	(1907)1914
ATTWATER, H. P., 2120 Genesee St., Houston, Texas.....	(1891)1901
BAILEY, VERNON, 1834 Kalorama Ave., Washington, D. C....	(1887)1901
BAILEY, Mrs. VERNON, 1834 Kalorama Ave., Washington, D. C.	(1885)1901
BAILY, WILLIAM L., 220 E. Lancaster Ave., Ardmore, Pa.....	(1886)1901
BARBOUR, Dr. THOMAS, Mus. Comp. Zoölogy, Cambridge, Mass.	(1903)1914
BARTSCH, Prof. PAUL, U. S. Nat. Museum, Washington, D. C.	(1896)1902
BECK, ROLLO HOWARD, R. D. 288, San José, Calif.....	(1894)1917
BERGTOLD, Dr. W. H., 1159 Race St., Denver, Colo.....	(1889)1914
BOND, FRANK, 3127 Newark St., N. W., Washington, D. C....	(1887)1901
BOWLES, JOHN HOOPER, The Woodstock, Tacoma, Wash.....	(1891)1910
BRAISLIN, Dr. WILLIAM C., 425 Clinton Ave., Brooklyn, N. Y.	(1894)1902
BROOKS, ALLAN, Okanagan Landing, B. C.....	(1902)1909
BROOKS, Wm. SPRAGUE, 234 Berkeley St., Boston, Mass.....	(1907)1917
BRYAN, Wm. ALANSON, Museum Exposition Park, Los Angeles, Calif.	(1898)1901
BRYANT, Dr. HAROLD CHILD, Mus. Vert. Zoöl., Berkeley, Calif.	(1913)1918
BURNS, FRANK L., Berwyn, Pa.....	(1891)1901
BUTLER, AMOS W., 52 Downey Ave., Irvington, Indianapolis, Ind.	(1885)1901

- CHAMBERS, W. LEE, Box 4, Eagle Rock, Calif. (1907)1913
 CHAPIN, JAMES P., Amer. Mus. Nat. Hist., New York, N. Y. (1906)1917
 CHERRIE, GEORGE K., Newfane, Vt. (1891-1912) (1917)1918
 CLARK, DR. HUBERT L., Mus. Comp. Zool. Cambridge, Mass. (1886)1902
 DAWSON, WM. L., R. D. 3, Box 110, Santa Barbara, Calif. (1895)1905
 DEANE, WALTER, 29 Brewster St., Cambridge, Mass. (1897)1901
 EATON, Prof. ELON HOWARD, 678 Main St., Geneva, N. Y. (1895)1907
 EVERMANN, Prof. B. W., Calif. Acad. Sci., San Francisco, Calif. (1883)1901
 FARLEY, JOHN A., 52 Cedar St., Malden, Mass. (1904)1919
 FINLEY, WILLIAM L., 651 East Madison St., Portland, Ore. (1904)1907
 GABRIELSON, IRA N., 220 P. O. Bldg., Portland, Ore. (1912)1920
 GAULT, BENJAMIN TRUE, 2313 Washington Blv'd., Chicago, Ill. (1885)1903
 GOLDMAN, EDWARD A., Biological Survey, Washington, D. C. (1897)1902
 GRISCOM, LUDLOW, 37 5th Ave., New York, N. Y. (1908)1918
 HARPER, FRANCIS, 3101 24th St., N. E., Washington, D. C. (1907)1917
 *HARRIS, HARRY, 18 West 52nd St., Kansas City, Mo. (1911)1919
 HERRICK, Prof. FRANCIS H., Adelbert College, Cleveland, O. (1913)1919
 HERSEY, F. SEYMOUR, 6 Maple Ave., Taunton, Mass. (1911)1916
 HOFFMAN, RALPH, Santa Barbara School, Carpinteria, Calif. (1893)1901
 HOLLISTER, NED, Nat. Zoölogical Park, Washington, D. C. (1894)1910
 HOWELL, A. B., 268 S. Orange Grove Ave., Pasadena, Calif. (1909)1916
 HOWELL, ARTHUR H., 2919 S. Dakota Ave., Washington, D. C. (1889)1902
 JACOBS, J. WARREN, 404 S. Washington St., Waynesburg, Pa. (1889)1904
 JEFFRIES, WILLIAM A., 11 Pemberton Square, Boston, Mass. (1883)1901
 JOB, HERBERT K., 291 Main St., West Haven, Conn. (1896)1901
 KALMBACH, EDWIN R., Biological Survey, Washington, D. C. (1910)1915
 *KENNARD, F. H., Dudley Road, Newton Centre, Mass. (1892)1912
 KNOWLTON, F. H., U. S. Nat. Mus., Washinton, D. C. (1883)1902
 *LAW, J. EUGENE, Mus. Vert. Zool., Berkeley, Calif. (1907)1916
 MACKAY, GEORGE H., 304 Bay State Road, Boston, Mass. (1890)1901
 MAILLIARD, JOHN W., 230 California St., San Francisco, Calif. (1895)1901
 MILLER, Dr. LOYE HOLMES, Southern Branch Univ. Calif., Los Angeles, Calif. (1918)1920
 MOORE, ROBERT THOMAS, Onawa, Me. (1898)1914
 MORRIS, GEORGE SPENCER, Olney, Philadelphia, Pa. (1887)1903
 MORRIS, ROBERT O., 82 Temple St., Springfield, Mass. (1888)1904
 MURDOCH, JOHN, 16 High Rock Way, Allston, Mass. (1883)1901
 NICHOLS, JOHN T., Am. Mus. Nat. Hist., New York, N. Y. (1901)1914
 NORTON, ARTHUR H., Mus. Nat. Hist., 22 Elm St., Portland, Me. (1890)1902
 PEARSON, T. GILBERT, 1974 Broadway, New York, N. Y. (1891)1902
 PENARD, THOMAS E., 12 Norfolk R'd, Arlington, Mass. (1912)1919
 PENNOCK, CHAS. J., Kennett Square, Pa. (1888)1901
 PETERS, JAMES LEE, Harvard, Mass. (1904)1918
 PHILLIPS, Dr. JOHN C., WENHAM, Mass. (1904)1912
 PREBLE, EDWARD A., Biological Survey, Washington, D. C. (1892)1901

- RATHBURN, SAMUEL F., 304 Marion Bldg., Seattle, Wash..... (1893)1902
 RHODES, SAMUEL N., 81 Haddon Ave., Haddonfield, N. J..... (1885)1901
 RIVES, DR. WM. C., 1702 Rhode Island Ave., Washington, D. C. (1885)1901
 ROBINSON, COL. WIRT, U. S. A., West Point, N. Y..... (1897)1901
 SAUNDERS, ARETAS A., 48 Longview Ave., Fairfield, Conn..... (1907)1920
 SETON, ERNEST THOMPSON, Greenwich, Conn..... (1883)1901
 *SHERMAN, Miss ALTHEA R., National via McGregor, Iowa..... (1907)1912
 *SHIRAS, Hon. GEORGE, 3d, Stoneleigh Court, Washington, D. C.
 (1907)1915
 STEPHENS, FRANK, Nat. Hist. Museum, Dan Diego, Calif. (1883)1901
 STEPHENS, Prof. T. C., Morningside College, Sioux City, Iowa. (1909)1920
 STRONG, DR. REUBEN M., 706 S. Lincoln St., Chicago, Ill. (1889)1903
 *SWALES, BRADSHAW HALL, U. S. Nat. Mus., Washington, D. C. (1902)1909
 SWENK, MYRON W., 1410 N. 37th St., Lincoln, Neb..... (1904)1920
 THAYER, JOHN ELIOT, Lancaster, Mass..... (1898)1905
 TOWNSEND, DR. CHARLES H., Aquarium, Battery Park, New York,
 N. Y..... (1883)1901
 TOWNSEND, DR. C. W., 98 Pinckney St., Boston, Mass..... (1901)1905
 TROTTER, DR. SPENCER. Swarthmore College, Swarthmore, Pa. (1888)1901
 TYLER, DR. WINSON M., 522 Mass. Ave., Lexington, Mass. (1912)1917
 WARREN, E. R., 1511 Wood Ave., Colorado Springs, Colo.... (1902)1910
 WAYNE, ARTHUR T., Mt. Pleasant, S. C..... (1905)1906
 WILLETT, GEORGE, 2123 Court St., Los Angeles, Calif. (1912)1913
 *WILLIAMS, ROBERT WHITE, Dept. Agric., Washington, D. C. (1900)1918
 *WOLCOTT, DR. ROBERT H., State University, Lincoln, Neb.... (1901)1903
 WOOD, NORMAN A., Museum Univ. of Mich. Ann Arbor, Mich. (1904)1912
 WRIGHT, DR. ALBERT H., Upland Road, Ithaca, N. Y..... (1906)1919
 WRIGHT, MRS. MABEL OSGOOD, Fairfield, Conn..... (1895)1901

ASSOCIATES.

*Life Associate

- ABBOTT, CLINTON GILBERT, Orchard Hill, Rhinebeck, N. Y..... 1898
 ABBOTT, Miss HARRIET, Fryeburg, Me..... 1918
 ADAMS, BENJAMIN, Wethersfield, Conn..... 1911
 ADAMS, Rev. CHARLES L., New Canaan, Conn..... 1920
 ADAMS, WILLIAM C., 43 Clyde St., Newtonville, Mass..... 1920
 ADAMS, DR. Z. B., 43 Cottage Farm Road., Longwood, Mass..... 1908
 ADELMANN, HOWARD BERNHARDT, Stimson Hall, Cornell Univ., Ithaca
 N. Y..... 1919
 AHRENS, DR. T. G., Landanerstrasse 4, Berlin-Wilmersdorf, Germany. 1920
 AIKEN, Hon. JOHN, Superior Court, Court House, Boston, Mass..... 1905
 AIMAR, DR. CHARLES PONS, 4 Vanderhorst St., Charleston, S. C. . . 1916

ALBRIGHT, HORACE MARDEN, Yellowstone Park, Wyo.....	1919
*ALEXANDER, Miss ANNIE M., Suisun City, Calif.....	1911
ALEXANDER, EDWARD GORDON, 1603 South St., Lexington, Mo.....	1919
ALLEN, Mrs. AMELIA SANBORN, 37 Mosswood R'd, Berkeley, Calif....	1919
ALLEN, ARTHUR F., Sioux City, Iowa.....	1919
ALLEN, MARY P., 206 Moore St., Hackettstown, N. J.....	1913
ALMY, Mrs. CHARLES, 147 Brattle St., Cambridge, Mass.....	1919
ANDERSON, EDWIN C., Dell Rapids, S. D.....	1919
ANDERSON, Mrs. J. C., Great Barrington, Mass.....	1903
ANDREWS, WILLIAM, Courtney, Jackson Co., Mo.....	1919
ANGELL, WALTER A., 135 Mathewson St., Providence, R. I.....	1901
ANKENY, Miss HELEN, Rt. 10, Xenia, Ohio.....	1920
ANTHONY, H. E., Amer. Mus. Nat. Hist., New York, N. Y.....	1911
ARMITAGE, LUCIUS, 282 E. 162nd St., New York, N. Y.....	1918
ARMOUR, Mrs. GEORGE, Allison House, Princeton, N. J.....	1920
ARMSTRONG, EDWARD E., 2249 Calumet Ave., Chicago, Ill.....	1904
ARNOLD, EDWARD, Grand Trunk R'y., Montreal, Quebec.....	1894
ARNOLD, Dr. W. W., 504 N. Nevada Ave., Colorado Springs, Colo....	1910
ARTHUR, EDMUND WAITE, 7438 Perryville Ave., Ben Avon, Pitts-	
burgh, Pa.....	1919
ARTHUR, STANLEY CLISBY, 6043 Perrier St., New Orleans, La.....	1916
ASPINWALL, Mrs. CLARENCE A., 1839 Wyoming Ave., Washington,	
D. C.....	1916
ATHERTON, EDWARD H., 82 Ruthven St., Boston, 21, Mass.....	1917
ATWELL, GEORGE C., Strafford, N. H.....	1920
AVERILL, CHARLES KETCHUM, 406 Stratford Ave., Bridgeport, Conn.1919	
AYRES, Miss MARY ADELINE, 119 High St., Medford Mass.....	1915
BABCOCK CLYDE H. 3426 W. Kiowa St., Colo. Springs, Colo.....	1920
BABCOCK, DEAN, Long's Peak, Colo.....	1911
BABCOCK, DR. HAROLD LESTER, Woodleigh Road, Dedham, Mass....	1916
BACON, FRANCIS L., 236 Winona Ave., Germantown, Pa.....	1917
BADÉ, Dr. WM. FREDERIC, 2616 College Ave., Berkeley, Calif.....	1916
BADGER, ARTHUR C., 167 Dudley Road, Newton Centre, Mass.....	1917
BADGER, LESTER R., 2401 Lake Place, Minneapolis, Minn.....	1920
BAER, JOHN LEONARD, Apt. 1, The Maury, 19th & G Sts., N. W.,	
Washington, D. C.....	1920
BAGG, AARON C., 70 Fairfield Ave., Holyoke, Mass.....	1916
BAGG, EGBERT, 27 Sunset Place, Utica, N. Y.....	1916
BAGG, JOHN LEONARD, 89 Lexington Ave., Holyoke, Mass.....	1918
BAILEY, ALFRED M., Colorado Mus. Nat. Hist., Denver, Colo.....	1918
BAILEY, Prof. GUY A., Geneseo, N. Y.....	1910
BAILEY, SAMUEL WALDO, 64 S. Mountain R'd., Pittsfield, Mass.....	1909
BAIRD, Miss KATHERINE B., 815 Webster St., N. W., Washington,	
D. C.....	1918
BAKER, JACK D., Willets, Mendocino Co., Calif.....	1920

*BALDWIN S. PRENTISS, Williamson Bldg., Cleveland, Ohio.....	1917
BALES, DR. BLENN R., 149 W. Main St., Circleville, Ohio.....	1907
BALL, MRS. BENNET F., Oakville, Conn.....	1905
BALL, EDWARD M., East Falls Church, Va.....	1918
BALL, DR. JAS. P., 5001 Frankford Ave., Philadelphia, Pa.....	1911
BARBER, PROF. BERTRAM A., Hillsdale College, Hillsdale, Mich.....	1920
BARBER, FURNALD K., La Fox, Ill.....	1920
BARBOUR, REV. ROBERT, Y. M. C. A., Montclair, N. J.....	1902
BARKER, MISS HELEN, 421 E. Adams St., Sandusky, O.....	1918
BARNARD, JUDGE JOB, 1401 Fairmont St., Washington, D. C.....	1886
BARNES, CHARLES SYDNEY, 19 W. 31st St., Bayonne, N. J.....	1920
BARNES, CLAUDE T., 359 Tenth Ave., Salt Lake City, Utah.....	1908
BARNES, HON. R. MAGOON, Lacon, Ill.....	1880
BARRETT, CHAS. H. M., 1339 Valley Place S. E., Washington, D. C.....	1912
BARRETT, HAROLD LAWRENCE, 172 Huntington Ave., Boston, Mass.....	1909
BARROWS, IRA, 15 Maiden Lane, New York, N. Y.....	1920
BARROWS, MRS. W. H., 113 Appleton Ave., Pittsfield, Mass.....	1920
BARRY, MISS ANNA K., 5 Bowdoin Ave., Dorchester, Mass.....	1907
BARTLETT, MISS MARY F., 227 Commonwealth Ave., Boston, Mass.....	1912
BARTRAM, EDWIN B., Bushkill, Pike Co., Pa.....	1913
BASSETT, FRANK NEWTON, 1338 8th St., Alameda, Calif.....	1919
BATCHELOR, MARION W., 27 Janssen Place, Kansas City, Mo.....	1916
BATES, MISS EMELINE CLARK, 59-69 Scott St., Chicago, Ill.....	1920
BATES, REV. J. M., Red Cloud, Neb.....	1918
BATTEN, GEORGE, 46 Lloyd Road, Montclair, N. J.....	1914
BAYNES, ERNEST HAROLD, Meriden, N. H.....	1918
BEARD, THEODORE R., 970 Lincoln Place, Boulder, Colo.....	1920
BECKFORD, ARTHUR W., 10 Park St., Danvers, Mass.....	1919
BELL, DR. W. B., Biological Survey, Washington, D. C.....	1912
BENJAMIN, MRS. ALFRED, 350 Summer Ave., Newark, N. J.....	1920
BENJAMIN, C. H., 607 University St., W. Lafayette, Ind.....	1920
BENNETT, REV. GEORGE, Iowa City, Iowa.....	1913
BENSON, FRANK W., 46 Washington Sq., Salem, Mass.....	1920
BERLIN, MRS. CORA D., 813 Second St., Marietta, Ohio.....	1920
BERMAN, DANIEL, 70 Morningside Drive, New York, N. Y.....	1919
BICKNELL, MRS. F. T., 319 S. Normandie Ave., Los Angeles, Calif.....	1913
BIDDLE, MISS EMILY WILLIAMS, 2201 Sansom St., Philadelphia, Pa.....	1898
BIGELOW, MRS. A. P., Ogden, Utah.....	1919
BIGELOW, DR. LYMAN F., 80 Winter St., Norwood, Mass.....	1914
BIGELOW, DR. WILLIAM STURGIS, 56 Beacon St., Boston, Mass.....	1920
BISHOP, SHERMAN C., N. Y. State Museum, Albany, N. Y.....	1919
BLACK, ANDREW A., Margaret, Man., Canada.....	1919
BLACKWELDER, ELIOT, 317 Railway Exch. Bldg., Denver, Colo.....	1895
BLAISDELL, MISS RUTH, 126 Grand View Ave., Wollaston 10, Mass.....	1920
BLAKE, BENJAMIN S., Auburndale 66, Mass.....	1920

BLOOMFIELD, Mrs. C. C., 723 Main St., W. Jackson, Mich.....	1901
BLOWERS, Miss AGNES, Rt. 2, Morrisville, N. Y.....	1920
BOARDMAN, Miss E. D., 416 Marlborough St., Boston, Mass.....	1906
BODINE, Mrs. DONALDSON, 4 Mills Place, Crawfordsville, Ind.....	1916
BOEHNER, REGINALD STEPHEN, Syracuse Univ., Syracuse, N. Y.....	1919
BOGARDUS, Miss CHARLOTTE, Elm St., Coxsackie, N. Y.....	1909
BOLT, BENJAMIN FRANKLIN, 1421 Prospect Ave., Kansas City, Mo.....	1909
BOND, HARRY L., Lakesfield, Minn.....	1908
BONFELS, FREDERICK G., The Denver Post, Denver, Colo.....	1918
BONNETT, D. B., Bay Head, N. J.....	1920
BORLAND, Wm. G., 7 Wall St., New York, N. Y.....	1911
BOSSON, CAMPBELL, 30 State St., Boston, Mass.....	1906
*BOULTON, Wm. B., Morristown Trust Co., Morristown, N. J.....	1919
BOURNE, THOMAS L., Hamburg, N. Y.....	1913
BOWDISH, B. S., Demarest, N. J.....	1891
BOWDISH, Mrs. B. S., Demarest, N. J.....	1902
BOWDITCH, Dr. HAROLD, 44 Harvard Ave., Brookline, Mass.....	1900
BOWDITCH, JAMES H., 903 Tremont Bldg., Boston, Mass.....	1913
BOYD, DONALD H., Box 466, Hobart, Ind.....	1920
BOYD, Mrs. HARRIET T., 17 Marsh St., Dedham, Mass.....	1917
BRACKEN, Mrs. HENRY M., 1010 Fourth St., S. E., Minneapolis, Minn.....	1897
BRADBURY, W. C., 1440 Race St., Denver, Colo.....	1915
BRADLEE, THOMAS STEVENSON, South Sudbury, Mass.....	1902
*BRANDRETH, COURTNEY, Ossining, N. Y.....	1905
*BRANDRETH, FRANKLIN, Ossining, N. Y.....	1889
BRANDT, HERBERT W., 2025 East 88th St., Cleveland, Ohio.....	1915
BRANNON, PETER A., Box 358, Montgomery, Ala.....	1919
BREDER, CHAS. M. JR., Bureau Fisheries, Washington, D. C.....	1919
BREWSTER, Mrs. WILLIAM, The Charlesgate, 535 Beacon St., Boston, Mass.....	1912
BRICKENSTEIN, Miss MARY R., 1603 19th St., Washington, D. C....	1920
BRIDGE, EDMUND, 52 Wyman St., West Medford, Mass.....	1910
*BRIDGE, Mrs. EDMUND, 52 Wyman St., West Medford, Mass.....	1902
BRIMLEY, H. H., State Museum, Raleigh, N. C.....	1904
BRITTEN, Capt. G. S., 807 Walnut Ave., Syracuse, N. Y.....	1913
BROCKWAY, ARTHUR W., Hadlyme, Conn.....	1912
BRONSON, BARNARD S., 175 Jay St., Albany, N. Y.....	1920
BROOKING, A. M. Inland, Neb.....	1920
BROOKS, Rev. EARLE AMOS, 10 Beacon St., Everett, Mass.....	1892
BROOKS, GORHAM, 60 State St., Boston, Mass.....	1919
BROWN, Miss ANNIE H., 31 Maple St., Stoneham, Mass.....	1909
BROWN, Miss BERTHA L., 53 Court St., Bangor, Me.....	1918
BROWN, EDMUND P., 48 Union St., Belfast, Me.....	1920
BROWN, EDWARD J., 1609 S. Van Ness Ave., Los Angeles, Calif.....	1891
BROWN, G. FRANKLIN, "Stonebridge," Needham, Mass.....	1917
BROWN, HARRY A., 40 Talbot St., Lowell, Mass.....	1912

BROWN, MRS. HENRY TEMPLE, Lancaster, Mass.....	1912
BROWN, PLUMB, M. D., 175 State St., Springfield, Mass.....	1920
BROWN, ROY M., Boone, N. C.....	1919
BROWN, SAMUEL E., 10 Oakland St., Lexington, Me.....	1920
BROWN, WM. JAMES, 250 Oliver Ave., Westmount, Quebec.....	1908
BROWNING, WM. HALL, 16 Cooper Square, New York, N. Y.....	1911
BRUEN, FRANK, 69 Prospect St., Bristol, Conn.....	1908
BRUMBAUGH, CHALMERS S., 1020 Cathedral St., Baltimore, Md.....	1916
*BRUUN, CHAS A., 314 Reliance Bldg., Kansas City, Mo.....	1919
BUCHANAN, ROLLIN E., Excelsior, Minn.....	1918
BULL, CHARLES L., Oradell, N. J.....	1920
BULLOCK, D. S., c/o Amer. Embassy, Buenos Aires, Argentina....	1920
BUNKER, CHARLES D., Kansas University Museum, Lawrence, Kan.....	1916
BURBANK, MRS. DELANCEY G., 17 Cherry St., N. Adams, Mass.....	1920
BURGESS, HENRY C., M. D., 156 N. Main St., Canandaigua, N. Y....	1920
BURGESS, JOHN KINGSBURY, "Broad Oak," Dedham, Mass.....	1898
BURGESS, THORNTON WALDO, 61 Washington R'd., Springfield, Mass.....	1919
BURLEIGH, THOS. D., State College Agric., Athens, Ga.....	1913
BURNETT, WILLIAM L., State Agric. College, Fort Collins, Colo.....	1895
BURNHAM, JOHN, 218 Timken Bldg., San Diego, Calif.....	1920
BURNHAM, STEWART HENRY, c/o A. G. Lamoreux, Forest Home, R. 2, Ithaca, N. Y.....	1919
BURTCH, VERDI, Branchport, N. Y.....	1903
BUSHINGER, Miss MARY G., Monte Vista, Colo.....	1919
BUTLER, EDWARD, Baines, La.....	1920
BUTLER, Miss VIRGINIA, Stockbridge, Mass.....	1919
BUTTERWORTH, FRANK SEILER, Choate School, Wallingford, Conn....	1918
BUTTS, HARRY W., Gambrills, Anne Arundel Co., Md.....	1920
BUZZELL, MRS. JAS. C., 11 Hudson St., Bangor, Me.....	1918
BYRD, MRS. HIRAM, University, Ala.....	1918
CADUC, EUGENE E., 531 Massachusetts Ave., Boston, Mass.....	1910
CADY, Prof. WALTER GUYTON, 49 High St., Middletown, Conn.....	1916
CAHN, ALVIN R., 4720 Greenwood Ave., Chicago, Ill.....	1917
CALDWELL, GUY C., 630 Oxford St., Cambridge, Mass.....	1920
CALLENDER, JAMES PHILIPS, 45 Wall St., New York, N. Y.....	1903
CALVERT, EARL W., c o. J. W. Noble, Harrow, Ont., Canada.....	1919
CAMBURN, MRS. OSMAN M., 6 Oak Knoll, Arlington 74, Mass.....	1920
CAMPINI, CHAS. A., 154 E. 33rd St., New York, N. Y.....	1919
CANNON, GABRIEL, Spartanburg, S. C.....	1920
CANTWELL, GEO. G., 901 W. Main Ave., Puyallup, Wash.....	1916
CARLISLE, GEORGE L., JR., 178 E. 70th St., New York, N. Y.....	1920
CARPENTER, Rev. C. K., 1724 Sunnyside Ave., Chicago, Ill.....	1894
CARPENTER, GEORGE I., 129 Dean St., Brooklyn, N. Y.....	1907
CARRIGER, H. W., 5185 Trask St., Fruitvale Station, Oakland, Calif.....	1913
CARRYL, FRANK M., 1 Princeton St., Nutley, N. J.....	1919
CARTER, C. M., 702 N. 6th St., St. Joseph, Mo.....	1920

CARTER, JOHN D., Lansdowne, Pa.....	1907
CARTWRIGHT, W. J., 15 Latham St., Williamstown, Mass.....	1920
CASE, MRS. GEO. B., Englewood, N. J.....	1920
CASH, HARRY A., 420 Hope St., Providence, R. I.....	1898
CASWELL, MRS. ARTHUR E., 241 Union St., Athol, Mass.....	1918
CHAMBERLAIN, CHAUNCEY W., 36 Lincoln St., Boston, Mass.....	1885
CHAPIN, MISS ANGIE C., 50 Saratoga Ave., Yonkers, N. Y.....	1896
CHAPMAN, MRS. F. M., Englewood, N. J.....	1908
CHASE, RICHARD MORTON, 164 Westminster R'd, Rochester, N. Y....	1919
CHASE, SIDNEY, 25 Ames Bldg., Boston, Mass.....	1904
CHEESEMAN, MORTON R., R. D. 1., Rivera, Calif.....	1911
CHEESEMAN, WM. H., Biological Survey, Washington, D. C.....	1920
CHILDS, MISS HELEN P., Chevy Chase, Md.....	1920
CHILDS, HENRY EVERETT, 864 Broadway, E. Providence, R. I.....	1919
CHRISTIE, EDW. H., 5069 Kensington Ave., St. Louis, Mo.....	1920
CLAGET, CHAS W., Washington College, Chestertown, Md.....	1918
CLARK, ARTHUR L., Forest Home, Rt. 2, Ithaca, N. Y.....	1920
CLARK, AUSTIN HOBART, 1818 Wyoming Ave., Washington, D. C....	1919
CLARK, CLARENCE H., Lubec, Me.....	1913
CLARK, MISS EMILY L., Box 3, St. Johnsbury, Vt.....	1920
CLARK, JOSEPH P., M. D., 71 Marlborough St., Boston, Mass.....	1920
CLARK, JOSIAH H., 702 E. 23rd St., Paterson, N. J.....	1895
CLARKE, CHARLES E., 51 Summit R'd., Medford, Mass.....	1907
CLARKE, MISS HARRIET E., 9 Chesnut St., Worcester, Mass.....	1896
CLARKE, MISS MARY S., Franklin Sq. Hotel, Washington, D. C.....	1916
CLARKE, MISS ROWENA A., Kirkwood, Mo.....	1919
CLARKE, STANLEY F., 41 Taconic St., Pittsfield, Mass.....	1920
CLEAVES, HOWARD H., Conservation Comm., Albany, N. Y.....	1907
CLEVELAND, DR. CLEMENT, W. Palm Beach, Fla.....	1903
CLEVELAND, MISS LILIAN, Woods Edge R'd., West Medford, Mass...	1906
COALE, HENRY K., Highland Park, Ill.....	1883
COBB, MISS ANNIE W., 72 Oxford St., Arlington, Mass.....	1909
COBB, PHILIP HACKER, Loomis Inst., Windsor, Conn.....	1917
COBB, DR. STANLEY, Ponkapog, Mass.....	1909
CODMAN, JAMES M., 87 Milk St., Boston, Mass.....	1920
COFFIN, MRS PERCIVAL B., 39 S. La Salle St., Chicago, Ill.....	1905
COFFIN, ROBERT L., Mass. Agric'l Exp. Sta., Amherst, Mass.....	1917
COGGINS, HERBERT L., 2929 Piedmont Ave., Berkeley, Calif.....	1913
COLBURN, ALBERT E., 806 S. Broadway, Los Angeles, Calif.....	1891
COLE, JOHN L., Rt. 5, Nevada, Iowa.....	1920
COLE, DR. LEON J., College of Agric., Univ. of Wis., Madison, Wis....	1908
COMMONS, MRS. F. W., 608 Cham'r of Commerce, Minneapolis, Minn..	1902
CONGER, ALLEN C., Box 561, E. Lansing, Mich.....	1919
CONOVER, HENRY B., 6 Scott St., Chicago, Ill.....	1920
COOK, FRANKLIN P., Seaside Hotel, Atlantic City, N. J.....	1920

COOK, FREDERICK, W., 1604 East Harrison St., Seattle, Wash.....	1915
COOK, Miss LILIAN GILLETTE, Long Lea Farm, Amherst, Mass.....	1899
*COOKE, Miss MAY THACHER, 1328 Twelfth St., Washington, D. C.....	1915
COOKMAN, ALFRED, Dept. of Science, Glendale H. S., Glendale, Calif.....	1920
COOLIDGE, PHILIP T., 31 Central St., Bangor, Me.....	1919
COPE, FRANCIS R., JR., Dimock, Pa.....	1892
COPELAND, Miss ADA B., 1103 White Ave., Grand Junction, Colo....	1917
COPELAND, MANTON, 88 Federal St., Brunswick, Me.....	1900
CORDIER, Dr. A. H., 415 Benton Blv'd., Kansas City, Mo.....	1920
COUES, Dr. WM. P., 31 Massachusetts Ave., Boston, Mass.....	1920
COURSEN, BLAIR, 560 Wauwatosa Ave., Wauwatosa, Wis.....	1918
COURT, EDWARD J., 1723 Newton St., N. W., Washington, D. C.....	1919
COVELL, Dr. HENRY H., 1600 East Ave., Rochester, N. Y.....	1918
COX, RODMAN DAYTON, Y. M. C. A., Rochester, N. Y.....	1919
CRAIG, WALLACE, Univ of Maine, Orono, Me.....	1912
CRANDALL, LEE S., N. Y. Zool Park, New York, N. Y.....	1909
CRANE, Miss CLARA L., Dalton, Mass.....	1904
CRANE, Mrs. ZENAS, Dalton, Mass.....	1904
Craven, ALLAN B., 3 Spruce St., Boston, Mass.....	1919
CRIDDLE, NORMAN, Treesbank, Man.....	1918
CROCKER, WM. T., 143 E. 35th St., New York, N. Y.....	1920
*CROSBY, MAUNSELL S. Rhinebeck N. Y.....	1904
CROSS ALBERT ASHLEY, Huntington, Mass.....	1918
CROSSMAN, ANNIE F., Mus. Nat. Hist., Pittsfield, Mass.....	1920
CROWELL, Miss J. OLIVIA, Dennis, Mass.....	1918
CUDWORTH, WARREN H., Assonet, Mass.....	1919
CUMMINGS, Miss EMMA G., 16 Kennard Road, Brookline, Mass.....	1903
CUNNINGHAM, J. WALTER, 3009 Dunham Ave., Kansas City, Mo....	1919
CURRIER, EDMONDE SAMUEL, 416 E. Chicago St., Portland, Ore....	1894
CURRIE, ROLLO P., 632 Keefer Pl., Washington, D. C.....	1895
CURRY, HASKELL BROOKS, 60 Bay State Road, Boston, 17, Mass....	1916
CURTIS, CHARLES P., 244 Beacon St., Boston, Mass.....	1915
CURTIS, ROY Q., JR., 11 W. 76th St., New York, N. Y.....	1919
CUSHMAN, Miss ALICE, 919 Pine St., Philadelphia, Pa.....	1910
CUTTER, Miss LUCIA B., Jaffrey, N. H.....	1920
DALEY, Miss MARY WOOD, Sleighton Farm, Darling P. O., Delaware Co., Pa.....	1920
DANE, Mrs. ERNEST B., Chestnut Hill, Mass.....	1912
DANFORTH, STUART T., 115 N. 6th Ave., New Brunswick, N. J.....	1916
DANIELS, EDWARD S., 3869 A Conn. Ave., St. Louis, Mo.....	1919
DAVENPORT, Mrs. ELIZABETH B., Brattleboro, Vt.....	1898
DAVIES, Miss DOROTHY E., Blackinton, Mass.....	1920
DAVIS, Miss BERTHA E., 22 Cypress Place, Brookline 46, Mass.....	1920
DAVIS, JOHN M., 737 M. St., Eureka, Calif.....	1920
DAVIS, R. N., Everhart Museum, Scranton, Pa.....	1920

DAWSON, Prof. RALPH W., 1105 N. 33rd St., Lincoln, Neb.....	1920
DAY, CHESTER SESSIONS, 15 Custom House St., Boston, Mass.....	1897
DEAN, F. ROY, 3465 S. Spring Ave., St. Louis, Mo.....	1919
DEAN, R. H., 720 Quintard Ave., Anniston, Ala.....	1913
DEANE, GEORGE CLEMENT, 80 Sparks St., Cambridge, Mass.....	1899
DEARBORN, SAMUEL S., 9 Massachusetts Ave., Boston, Mass.....	1919
DELOACH, R. J. H., 10154 Longwood Drive, Chicago, Ill.....	1910
DELURY, Dr. RALPH E., Dominion Observatory, Ottawa, Canada...	1920
DENSMORE, Miss MABEL, 910 4th St., Red Wing, Minn.....	1910
DENT, PAUL, 3714 West Pine B'lv'd, St. Louis, Mo.....	1919
DERBY, RICHARD, Oyster Bay, L. I., N. Y.....	1898
DEWEY, Dr. CHARLES A., 78 Plymouth Ave., Rochester, N. Y.....	1900
DEWIS, Dr. JOHN W., 69 Newberry St., Boston 17, Mass.....	1920
DEXTER, Prof. JOHN SMITH, Univ. Sask., Saskatoon, Sask.....	1919
DEXTER LEWIS, 1889 Elm St., Manchester, N. H.....	1915
DEXTER, Rev. SMITH OWEN, Concord, Mass.....	1920
DICE, LEE RAYMOND, Mus. Zoöl., Ann Arbor, Mich.....	1918
DICKEY, DONALD R., San Rafael Heights, Pasadena, Calif.....	1907
DILLE, FREDERICK M., Niobrara Reservation, Valentine, Neb.....	1892
DINGLE, EDWARD VON S., Summerton, S. C.....	1920
DINGS, McCLELLAND, 5715 Enright Ave., St. Louis, Mo.....	1919
DIONNE, C. E., Laval University, Quebec, Canada.....	1893
DIXON, FREDERICK J., 111 Elm Ave., Hackensack, N. J.....	1891
DIXON, JOSEPH S., Univ. of Calif., Berkeley, Calif.....	1917
DOANE, GILBERT HARRY, The Elms, Fairfield, Vt.....	1919
DOBROSKY, Miss IRENE, 120 Oak Ave., Ithaca, N. Y.....	1920
DONAHUE, RALPH J., Bonner Springs, Kan.....	1919
DRAPER, WALLACE S., Wayland, Mass.....	1920
DRIER, THEODORE, 35 Remsen St., Brooklyn, N. Y.....	1919
DRUMMOND, Miss MARY, 510 Spring Lane, Lake Forest, Ill.....	1904
DUANE, ARTHUR, "Cool Gales," Sharon, Conn.....	1920
DUBOIS, ALEXANDER D., 327 S. Glenwood Ave., Springfield, Ill....	1918
DULL, Mrs. A. P. L., 211 N. Front St., Harrisburg, Pa.....	1900
DUNBAR, Miss LULA, R. D. 1, Elkhorn, Wis.....	1918
DUNHAM, Miss LUCINDA H., 34 Crandall St., Adams, Mass.....	1920
DUNN, Mrs. H. A., Rt. 3, Box 63, Athol, Mass.....	1920
DURAND, Miss LAURA B., 11 Oriole Gardens, Toronto, Ont.....	1919
DURFEE OWEN, Box 125, Fall River, Mass.....	1887
DURYEA, Miss ANNIE B., 62 Washington St., Newark, N. J.....	1911
DYKE, ARTHUR CURTIS, 205 Summer St., Bridgewater, Mass.....	1902
EADIE, GUY L., Berwyn, Pa.....	1920
EARL, D. OSBOURNE, 17 Bates St., Cambridge, Mass.....	1919
EASTMAN, Major FRANCIS B., Camp Grant, Ill.....	1909
EASTMAN, Miss SARAH C., 51 Chapel St., Portland, Me.....	1920
*EATON, HOWARD, Wolf, Sheridan Co., Wyo.....	1918

EATON, Miss MARY S., 8 Monument St., Concord, Mass.....	1909
EATON, SCOTT HARRISON, Box 653, Lawrenceville, Ill.....	1912
EDSON, JOHN M., Marietta Road, Bellingham, Wash.....	1886
EDSON, WM. L. G., 54 Fairview Ave., Rochester, N. Y.....	1916
EDWARDS, KATHERINE M., Wellesley College, Wellesley, Mass.....	1918
EHINGER, Dr. CLYDE E., 100 W. Rosedale Ave., West Chester, Pa....	1904
EIFRIG, Prof. C. W. GUSTAVE, 504 Monroe Ave., Oak Park, Ill.....	1901
EIMBECK, Dr. AUGUST F., New Haven, Mo.....	1906
EKBLAW, WALTER ELMER, 601 N. Willis Ave., Champaign, Ill.....	1911
ELIOT, WILLARD AYRES, 1011 Thurman St., Portland, Ore.....	1918
ELLIOT, Miss SARAH J., Union Hospital, Terre Haute, Ind.....	1920
ELLS, GEORGE P., Norwalk, Conn.....	1904
EMERSON, W. OTTO, Hayward, Calif.....	1916
EMMERICH, ROBERT D., 322 W. 100th St., New York, N. Y.....	1919
ENGLISH, Mrs. T. F., 3631 Campbell St., Kansas City, Mo.....	1919
ENO, HENRY LANE, Princeton, N. J.....	1918
ERICHSEN, W. J., 2311 Barnard St., Savannah, Ga.....	1919
ESLUCK, Miss AUGUSTINE W., 58 Highland Ave., Greenfield, Mass..	1920
EVANS, Dr. EVAN M., 550 Park Ave., New York, N. Y.....	1916
EVANS, FRANK C., Crawfordsville, Ind.....	1919
EVANS, WILLIAM B., Moorestown, N. J.....	1897
EYER, GEO. A., Short Hills, N. J.....	1918
FAIRMAN, Miss MARIAN, 4744 Kenwood Ave., Chicago, Ill.....	1920
FALGER, Mrs. WM., c o. California Nat'l Bank, Modesto, Calif....	1918
FARLEY, FRANK L., Camrose, Alberta.....	1920
FARRAR, CLARENCE D., 63 Eastern Ave., Lewiston, Me.....	1920
FAXON, ALLAN HART, 7 Edwards St., Southbridge, Mass.....	1916
FAY, S. PRESCOTT, 53 State St., Boston, Mass.....	1907
FELGER, ALVA HOWARD, North Side High School, Denver, Colo....	1898
FELL, Miss EMMA TREGO, 1534 N. Broad St., Philadelphia, Pa.....	1903
FERGUSON, HARRY L., Old Church Road, Greenwich, Conn.....	1920
FIELD, Dr. GEORGE W., 2807 18th St., N. W., Washington, D. C....	1910
FIELD, WM. L. W., Milton Acad., Milton, Mass.....	1920
FISHER, Miss ELIZABETH WILSON, 2222 Spruce St., Philadelphia, Pa.	1896
FISHER, Dr. G. CLYDE, American Mus. Nat. Hist., New York, N. Y.	1908
FITZPATRICK, WM. J., c/o. Brown, Durrell Co., 104 Kingston St., Boston, Mass.....	1920
FLEISHER, EDWARD, 1074 New York Ave., Brooklyn, N. Y.....	1916
FLETCHER, LYLE, Norton, Kan.....	1919
FLETCHER, Mrs. MARY E., Proctorsville, Vt.....	1898
FLOYD, CHARLES BENTON, 382 Wolcott St., Auburndale, Mass.....	1916
FOLSOM, Miss IDA M., Normal School, Presque Isle, Me.....	1920
FOOT, Dr. NATHAN CHANDLER, Readville, Mass.....	1916
FORBES, RALPH E., 328 Adams St., Milton, Mass.....	1917
FORD, EDWARD R., 4741 Brecon St., Chicago, Ill.....	1920

FORD, LEE M., Box 8, Great Falls, Mont.....	1919
FORD, Miss LOUISE PETIGRU, "The Heights," Aiken, S. C.....	1919
FORDYCE, GEO. L., 40 Lincoln Ave., Youngstown, Ohio.....	1901
FORTNER, Prof. HARRY C., Univ. Tennessee, Knoxville, Tenn.....	1920
*FOSTER, FRANCIS A., Edgartown, Mass.....	1918
FOSTER, FRANK B., Haverford, Pa.....	1916
FOTHERGILL, Miss E. R., 208 S. Whitney St., Hartford, Conn.....	1920
FOWLER, FREDERICK HALL, 221 Kingsley Ave., Palo Alto, Calif.....	1892
FOWLER, HENRY W., Acad. Nat. Sciences, Philadelphia, Pa.....	1898
FOX, Dr. WILLIAM H., 1826 Jefferson Place, Washington, D. C.....	1883
FRANCIS, NATHANIEL A., 35 Davis Ave., Brookline, Mass.....	1914
FRASER, DONALD, Johnstown, N. Y.....	1902
FREEMAN, Dr. C. D., Box 113, Medina, Ohio.....	1920
FREEMAN, Prof. DANIEL, 711 7th St., S., Fargo, N. D.....	1920
FREEMAN, Miss HARRIET E., 37 Union Park, Boston, Mass.....	1903
FRENCH, CHARLES H., Canton, Mass.....	1904
FRENCH, Mrs. CHAS H., Canton, Mass.....	1908
FROST, ALLEN, c. o. Trussell Mfg. Co., Poughkeepsie, N. Y.....	1919
FROTHINGHAM, Mrs. RANDOLPH, 113 Commonwealth Ave., Boston, Mass.....	1913
FRY, Rev. HENRY J., 88, 27th St., Elmhurst, L. I., N. Y.....	1916
*FUGUET, HOWARD, 312 Bullitt Bldg., Philadelphia, Pa.....	1919
FULLER, HENRY C., 1348 Euclid St., Washington, D. C.....	1916
FULLER, Mrs. T. OTIS, Needham, Mass.....	1909
GAGE, ARTHUR, Camp Douglas, Rt. 2, Box 36, Wisconsin.....	1920
GANIER, ALBERT F., 2507 Ashwood Ave., Nashville, Tenn.....	1917
GARDINER, CHARLES BARNES, 175 W. Main St., Norwalk, Ohio.....	1903
GARDNER, ASTON COLEBROOK, 1805 Market St., Wilmington, Del....	1919
GARDNER, Mrs. E. P., 140 Gibson St., Canandaigua, N. Y.....	1920
GARDNER, JAMES H., 626 Kennedy Bldg., Tulsa, Okla.....	1919
GARDNER, Mrs. W. H., Bucksport, Me.....	1920
GARST, Dr. JULIUS, 29 Oread St., Worcester, Mass.....	1916
GASTON, Dr. P. K., Pratt, Kan.....	1919
GERTH, WALTER G., 3929 Greenvew Ave, Chicago, Ill.....	1918
GERTKEN, Prof. SEVERIN, St. John's University, Collegeville, Minn..	1912
GIANINI, CHAS A., Poland, N. Y.....	1911
GIBSON, LANDGON, 5 Union St., Schenectady, N. Y.....	1887
GILBERT, Mrs. F. M. Walpole, N. H.....	1919
GILCHRIST, Mrs. D. A., 1519 W. Washington St., Phoenix, Ariz.....	1920
GILLIAM, ROBERT A., Southwestern Bldg., Dallas, Texas.....	1920
GILMAN, M. FRENCH, Banning, Calif.....	1907
GLADDING, Mrs. JOHN R., 30 Stimson Ave., Providence, R. I.....	1912
GLEASON, Mrs. C. H., 700 Madison Ave., S. E., Grand Rapids, Mich.	1917
GLOYD, HOWARD K., Wellsville, Kan.....	1920
GOELITZ, WALTER A., 170 Nunda Boulevard, Rochester, N. Y.....	1916

GOLSAN, LEWIS S., Box 97, Prattville, Ala.....	1912
GOODE, MRS. F. B., Sharon, Mass.....	1918
GOODRICH, Miss JULIET T., State Line, Vilas County, Wis.....	1904
GORDON, HARRY E., 307 Laburnum Cres., Rochester, N. Y.....	1911
GORMLEY, A. LIGNORI, Box 345, Arnprior, Ont.....	1918
GORST, CHARLES C., 28 Beauford R'd., Jamaica Plain, Boston, Mass.....	1916
GOULD, JOSEPH E., Barboursville, Ky.....	1889
GOWANLOCK, J. NELSON, Dept. Zool. Univ. Chicago, Chicago, Ill....	1919
GOWDY, EARL R., Box 646, Beacon Falls, Conn.....	1920
GRAHAM, Hon. WM. J., Aledo, Ill.....	1909
GRANGE, WALLACE B., Ladysmith, Wis.....	1920
GRANGER, WALTER, Amer. Mus. Nat. Hist., New York, N. Y.....	1891
GRANT, MRS. ADELE L., Dept. Botany, Cornell Univ., Ithaca, N. Y.....	1919
GRANT, WM. W., 600 Castle St., Geneva, N. Y.....	1910
GRAVES, Miss BESSIE M., 15 Chapman Ave., Easthampton, Mass....	1920
GRAVES, MRS. CHARLES B., 4 Mercer St., New London, Conn.....	1905
GRAY, GEORGE, Greenvale, Poughkeepsie, N. Y.....	1920
GRAY, GEORGE M., Box 89, Woods Hole, Mass.....	1916
GREENOFF, Rev. A. E., 220 Montgomery Ave., W. Pittston, Pa.....	1919
GREEN, HORACE OAKES, 114 North Ave., Wakefield, Mass.....	1917
GREENLAW, Jos. M., 28 Budleigh St., Beverly, Mass.....	1920
GREENOUGH, HENRY VOSE, 1134 Beacon St., Brookline, Mass.....	1901
GREGORY, STEPHEN S., JR., 456 Surf St., Chicago, Ill.....	1916
GRIFFEE, WILLET E., Route 3, Corvallis, Ore.....	1919
GRIFFIN, BERTRAM S., 22 Currie Ave., Haverhill, Mass.....	1917
GROSS, Dr. ALFRED O., Bowdoin College, Brunswick, Me.....	1907
GROSVENOR, Miss LULU E., 304 Mass. Ave., Washington, D. C.....	1920
GUINOTTE, Judge JULES E., 1215 Manheim R'd., Kansas City, Mo....	1919
GUNTHERP, Prof. HORACE, 2107 E. 55th St., Univ. of Wash., Seattle, Wash.....	1919
HAAS, ROBERT C., 504 Swetland Bldg., Cleveland, Ohio.....	1919
HADLEY, ALDEN H., Monrovia, Ind.....	1906
HADELER, E. W., 520 So. State St., Painesville, Lake Co., Ohio.....	1920
HAGAR, J. A., Marshfield Hills, Mass.....	1914
HAILE, H. PENNINGTON, 28 Edwards St., Springfield, Mass.....	1919
HALL, F. GREGORY, Univ. of Wisconsin, Madison, Wis.....	1917
HALL, WM. WEBSTER, JR., 15 E. 75th St., New York, N. Y.....	1917
HALLINAN, THOMAS, 212 Madison Ave., Paterson, N. J.....	1919
HALLINEN, JOSEPH E., Coopertown, Okla.....	1919
HAMILTON, Dr. BAKER A., Highland Park, Ill.....	1920
HANDLEY, CHAS. O., Lewisburg, W. Va.....	1916
HANKINSON, THOS. L., N. Y. College of Forestry, Syracuse, N. Y....	1897
HANNA, G. DALLAS, California Acad. Sci., San Francisco, Calif.....	1919
HANNA, WILSON CREAL, 1000 Pennsylvania Ave., Colton, Calif.....	1919
HANNUM, WILLIAM E., Primos, Delaware Co., Pa.....	1920

HARDISTY, ARTHUR H., 2326 First St., N. W., Washington, D. C.	1918
HARDON, Mrs. HENRY W., Wilton, Conn.	1905
HARPER, SAMUEL A., 230 N. Kingston Ave., River Forest, Ill.	1920
HARRINGTON, Mrs. A. B., Lincoln, Mass.	1919
HARRINGTON, RALPH M., 595 Ashland Ave., Buffalo, N. Y.	1915
*HARRISON, GEO. L., JR., 400 Chestnut St., Philadelphia, Pa.	1919
HARRISON, HARRY MORGAN, 503 Linden St., Camden, N. J.	1919
HART, Miss HELEN, Williamstown, Mass.	1920
HARTLEY, GEO. INNESS, 344 W. 87th St., New York, N. Y.	1919
HARTSHORN, HAROLD IRA, 53 S. 12th St., Newark, N. J.	1918
HARVEY, JOHN L., 3 Moody St., Waltham, Mass.	1916
HASBROUCK, HENRY C., 2151 12th St., Troy, N. Y.	1920
HASKELL, Miss SADIA, 1236 11th St., N. W., Washington, D. C.	1916
HATHAWAY, Mrs. E. L., Spring St., R. D. 1, W. Bridgewater, Mass.	1920
HATHAWAY, HARRY S., Box 1466, Providence, R. I.	1897
HAVEMEYER, H. O., Mahwah, N. J.	1893
HAVEMEYER, H. O., Jr., Mahwah, N. J.	1919
HAVEN, HERBERT, M. W., 500 Forest Ave., Portland, Me.	1920
HAWES, Dr. EDWARD E., Hyannis, Mass.	1920
HAWK, JOHN L., 5843 Plymouth Ave., St. Louis, Mo.	1920
HEACOCK, ESTHER, Wyncote, Pa.	1918
HEALEY, ALDEN P., 2006 Northampton St., Holyoke, Mass.	1919
HEATH, Miss CHARLOTTE M., Box 76, Easton, Mass.	1920
HEDGES, CHAS. F., 1505 Pearl St., Miles City, Mont.	1919
HELME, ARTHUR H., Miller Place, N. Y.	1888
HEMENWAY, AUGUSTUS, Tavern Club, Boylston Pl., Boston, Mass.	1920
HEMPEL, Miss KATHLEEN, Elkader, Iowa.	1919
HEMPHILL, ASHTON ERASTUS, Holyoke, Mass.	1919
HENDERSON, HARLIN C., Carpinteria, Santa Barbara Co., Calif.	1920
*HENDERSON, J. B., 16th St., & Florida Ave., N. W., Washington, D. C.	1918
HENDERSON, Judge JUNIUS, 627 Pine St., Boulder, Colo.	1903
HENDERSON, WALTER C., 4727 13th St., N. W., Washington, D. C.	1917
HENDRICKSON, W. F., 276 Hillside Ave., Jamaica, N. Y.	1885
HENNESSEY, FRANK C., 457 Albert St., Ottawa, Ont.	1914
HERMANN, THEODORE L., 273 Neal Dow Ave., New Brighton, N. Y.	1916
*HERRICK, HAROLD, 123 William St., New York, N. Y.	1905
HERRICK, NEWBOLD L., 60 Wall St., New York, N. Y.	1913
HERRICK, N. LAWRENCE, Cedarhurst, N. Y.	1917
HILL, JAMES HAYNES, Box 485, New London, Conn.	1897
HILL, Mrs. THOMAS R., Box 491, Chautauqua, N. Y.	1903
HIMMAL, WALTER J., Radcliff, Iowa.	1920
HINCKLEY, GEO. LYMAN, Redwood Library, Newport, R. I.	1912
HINE, Prof. JAMES STEWART, Ohio State Univ., Columbus, Ohio.	1899
HITCHCOCK, Mrs. WILLARD C., 60 Central St., Palmer, Mass.	1920

HIX, GEORGE E., 100 W. 91st St., New York, N. Y.....	1904
HOLLAND, HAROLD MAY, Galesburg, Ill.....	1910
HOLLAND, R. P., 2273 Woolworth Bldg., New York, N. Y.....	1920
HOLLAND, DR. WILLIAM J., Carnegie Museum, Pittsburgh, Pa.....	1899
HOLLISTER, G. B., 4 E. 5th St., Corning, N. Y.....	1919
HOLLISTER, WARREN D., 510 McPhee Bld., Denver, Colo.....	1901
HOLMAN, RALPH H., 25 Livermore Rd., Wellesley Hills, Mass.....	1907
HOLT, ERNEST G., c. o. Miss Olivia Holt, 312 Bell Bldg., Montgomery, Ala.....	1911
HONYWILL, ALBERT W., Jr., 211 Ridgefield St., Hartford, Conn.....	1907
HORSFALL, ROBERT BRUCE, 1457 E. 18th St., Portland, Ore.....	1905
HORSEY, RICHARD E., Highland P'k., Reservoir Ave., Rochester, N. Y.,.....	1919
HOTCHKISS, NEIL, Marcellus, N. Y.....	1919
HOUGHTON, CLARENCE, 533 Washington Ave., Albany, N. Y.....	1920
HOWLAND, R. H., 164 Wildwood Ave., Upper Montclair, N. J.....	1903
HOYT, WILLIAM H., Box 425, Stamford, Conn.....	1907
HUBBARD, C. ANDRESEN, 287 E. 44th St., Portland, Ore.....	1916
HUBBARD, Prof. MARIAN E., 15 Appleby Road, Wellesley, Mass....	1916
HUBBARD, RALPH, 1038 University Ave., Boulder, Colo.....	1916
HUBER, WHARTON, 225 St. Marks Sq., Philadelphia, Pa.....	1915
HUEY, L. M., Nat. Hist. Mus., Balboa Park, San Diego, Calif....	1920
HUGHES, GEO. T., Watchung, N. J.....	1919
HUGHES, DR. WILLIAM E., 3945 Chestnut St., Philadelphia, Pa.....	1920
HUNN, JOHN T. SHARPLESS, 1218 Prospect Ave., Plainfield, N. J....	1895
HUNT, CHRISWELL JOHN, 5347 W. Superior St., Chicago, Ill.....	1919
HUNT, Miss LUCY O., 185 Beacon St., Hartford, Conn.....	1919
HUNT, RICHARD M., Mus. Vert. Zool., Berkeley, Calif.....	1918
HURD, Miss FRANCES A., 43 West Ave., S. Norwalk, Conn.....	1919
HUSHER, Mrs. GERTRUDE H., 821 S. Hope St., Los Angeles, Calif....	1918
HYDE, Mrs. S. E., Regina, Idaho.....	1918
HYSLOP, SAMUEL, 42 Bellevue St., Newton, Mass.....	1919
INGERSOLL, ALBERT M., 908 F St., San Diego, Calif.....	1885
ISHAM, CHAS B., 50 W. 67th St., New York, N. Y.....	1891
JACKSON, DR. HARTLEY H. T., Biological Survey, Washington, D. C.	1910
JACKSON, JOHN W., Belchertown, Mass.....	1920
JACKSON, RALPH W., R. D. 1, Cambridge, Md.....	1918
JACKSON, THOMAS H., 304 N. Franklin St., West Chester, Pa.....	1888
JAMES, NORMAN, Catonsville, Md.....	1913
JAMES, THOMAS A., Augusta, Me.....	1920
JANVEIN, DR. E. R. P., 515 Park Ave., New York, N. Y.....	1919
JENKS, CHAS W., Bedford, Mass.....	1912
JENNEY, Hon. CHARLES F., 100 Gordon Ave., Hyde Park, Mass....	1905
JENNINGS, DR. GEO. H., Jewett City, Conn.....	1918
JENNINGS, RICHARD D., 129 Harrison St., East Orange, N. J.....	1913

JENSEN, J. K., U. S Indian School, Santa Fé, N. Mex.	1912
JEWETT, STANLEY G., 582 Bidwell, Portland, Ore	1906
JOHNSON, Prof. CHAS. E., Dept. Zoöl., Kan. Univ., Lawrence, Kan.	1919
JOHNSON, FRANK E., 16 Amackassin/Terrace, Yonkers, N. Y.	1888
JOHNSON, REGINALD M., 60 State St., Boston, Mass.	1920
JOHNSON, WARD L., Lawrence School, Hewlett, Long Island, N. Y.	1920
JOHNSTONE, WALTER B., Edgewood, Arrow Lake, B. C.	1920
JONES, Dr. LOMBAARD CARTER, Falmouth, Mass.	1917
JONES, S. PAUL, 207 W. Washington Ave., Madison, Wis.	1920
JONES, WILLIAM F., Norway, Me.	1918
JORDAN, A. H. B., Everett, Wash.	1888
JUMP, Mrs. EDWIN R., 97 Oakleigh Road, Newton, Mass.	1910
KAEDING, GEO. L., Cortez, Lander Co., Nev.	1918
KANE, Mrs. SUSAN MARY, Mich. Club Bldg., Seattle, Wash.	1919
KEE, HUNTER, Marlinton, W. Va.	1920
KELLOGG, RALPH T., Silver City, N. M.	1913
KELSO, Dr. JOHN E. H., Edgewood, Lower Arrow Lake, B. C.	1915
KENISTON, ALLAN, Vineyard Haven, Mass.	1917
KENNEDY, EDWARD H., South Easton, Mass.	1920
KENNEDY, Dr. HARRIS, Readville, Mass.	1916
*KENNEDY, HARRY H., 105 Vine St., Reno, Nev.	1920
KENT, DUANE E., 47 West St., Rutland, Vt.	1913
KENT, EDWARD G., 2595 Boulevard, Jersey City, N. J.	1919
KENT, EDWIN C., 156 Boadway, New York, N. Y.	1907
KESSEL, MARCEL H., 659 Auburn Ave., Buffalo, N. Y.	1920
KEYS, JAMES E., 328 St. George St., London, Ontario.	1899
*KIDDER, NATHANIEL T., Milton, Mass.	1906
KILGORE, WILLIAM, Jr, 1700 Stevens Ave, Minneapolis, Minn.	1906
KINGSBURY, FREDERICK S., 97 Oliver St., Boston, Mass.	1916
KING, LeROY, 20 E. 84th St., New York, N. Y.	1901
KING, MARK HUNTINGTON, 107 Elm Hill Ave., Boston, 21, Mass.	1920
KINGMAN, ROBERT H., 11 S. Cedar Ave., Arverne, N. Y.	1919
KIRKHAM, Mrs. JAMES W., 275 Maple St., Springfield, Mass.	1904
*KIRKHAM, STANTON D., 152 Howell St., Canandaigua, N. Y.	1910
KIRKWOOD, FRANK C., R. F. D., 3, Monkton, Md.	1892
*KIERN, ALBERT J. B., R. F. D. 4, Solomon, Kan.	1918
KITTREDGE, JOSEPH, Jr., Forest Service, Washington, D. C.	1910
KLOSEMAN, Miss J. E., Beal Hall, 20 Charlesgate W., Boston, Mass.	1909
KLOTS, ALEXANDER, 125 W. 78th St., New York, N. Y.	1919
KNAEBEL, ERNEST, 3707 Morrison St., Chevy Chase, D. C.	1906
KNOLHOFF, FERDINAND WILLIAM, Amityville, N. Y.	1890
KREHBIEL, LEONARD, W. 10th St., Upland, Calif.	1920
KRETZMAN, Prof. P. E., 3705 Texas Ave., St. Louis, Mo.	1913
KUBICHEK, D. P., Biological Survey, Washington, D. C.	1919
KUSER, ANTHONY R., Bernardsville, N. J.	1908

KUSER, MRS. ANTHONY R., Bernardsville, N. J.....	1910
KUSER, JOHN DRYDEN, Bernardsville, N. J.....	1910
LABARTHE, JULES, 85 2nd St., San Francisco, Calif.....	1920
LABRIE, JOSEPH D., 1717 E. 78th St., Kansas City, Mo.....	1913
LACEY, HOWARD GEORGE, R. F. D. 1, Kerrville, Texas.....	1892
LADD, HARRY STEPHEN, 4354 McPherson Ave., St. Louis, Mo.....	1919
LA DOW, STANLEY V., 622 W. 113th St., New York, N. Y.....	1919
LAING, HAMILTON M., 1277 E. 32nd St., Portland, Ore.....	1917
LAMB, CHAS R., 8 Highland St., Cambridge, Mass.....	1910
LANCASHIRE, MRS. JAMES HENRY, 7 East 75th St., New York, N. Y.....	1908
LANG, HERBERT, Amer. Mus. Nat. Hist., New York, N. Y.....	1997
LANGDON, ROY M., Littleton, Colo.....	1919
LANO, ALBERT, Fayetteville, Ark.....	1917
LARRABEE, Prof. AUSTIN P., Yankton College, Yankton, S. Dak.....	1918
LASTRETO, C. B., 260 California St., San Francisco, Calif.....	1919
LATHAM, ROY, Orient, N. Y.....	1916
LAUGHLIN, Miss EMMA E., 127 Walnut St., Barnesville, Ohio.....	1920
LAUGHLIN, J. A., Marshall, Mo.....	1919
LAURENT, PHILIP, 31 E. Mt. Airy Ave., Philadelphia, Pa.....	1902
LAWRENCE, A. G., City Health Dept., Winnipeg, Man.....	1920
LAWSON, RALPH, 88 Washington Sq. East, Salem, Mass.....	1917
LEARNED, Miss AGNES M., Wilkins St., Hudson, Mass.....	1920
LEAVITT, MRS. FLORENCE R., 42 Forest St., Lexington, Mass.....	1919
LEE, Mrs. L. W., El Cajon, San Diego Co., Calif.....	1920
LEFFINGWELL, DANA J., Aurora, N. Y.....	1919
LEISTER, CLAUDE W., McGraw Hall, Ithaca, N. Y.....	1916
LENGERKE, JUSTUS VON, 211 Highland Ave., Orange, N. J.....	1907
LEONHARD, W. J., Shoreham, Vt.....	1920
LEOPOLD, NATHAN F., Jr., 4754 Greenwood Ave., Chicago, Ill.....	1916
LEVEY, Mrs. WILLIAM, Alton Bay, N. H.....	1915
LEWIS, GEORGE P., 4559 Forrestville Ave., Chicago, Ill.....	1920
LEWIS, HARRISON F., Bergerville, Quebec, Canada.....	1912
LEWIS, Mrs. HERMAN E., 180 Grove St., Haverhill, Mass.....	1912
LIBBEY, ROBERT M., 520 New York Ave., N. W., Washington, D. C.....	1920
LIGHTFOOT, WILLIAM G., 197 Gilesen St., Canandaigua, N. Y.....	1920
LIEBOLD, ERNEST G., 94 Rhode I. Ave., Highland Park, Mich.....	1918
LIGON, J. STOKLEY, Box 131, Albuquerque, New Mexico.....	1912
LINCOLN, FREDERICK CHARLES, Biological Survey, Washington, D. C.....	1910
LINDSAY, Dr. D. MOORE, 808 Boston Block, Salt Lake City, Utah.....	1919
LINGS, GEO. H., Richmond Hill, Cheadle, Cheshire, England.....	1913
LINK, HENRY A., P. O. Box 76, Waterloo, Ind.....	1920
LITTLE, LUTHER, 2nd, 1403 Garfield Ave., So. Pasadena, Calif.....	1913
LLOYD, HOYES, 406 Queen St., Ottawa, Canada.....	1916
LOCKE, Dr. EDWIN A., 311 Beacon St., Boston, Mass.....	1920
LONG, CHAS. IRVING, 130 5th Ave., Roselle, N. J.....	1918

LONG, HARRY V., 260 Clarendon St., Boston, Mass.....	1920
LORD, J. ANDERSON, 13 Ash St., Danvers, Mass.....	1919
LORD, THOMAS HENRY, Newington, N. H.....	1916
LORING, J. ALDEN, Owego, N. Y.....	1917
LOTHROP, DR. OLIVER A., Waban, Mass.....	1920
LOW, ETHELBERT I., 120 Broadway, New York, N. Y.....	1907
LUCE, MRS. FRANCIS P., Box 216, Vineyard Haven, Mass.....	1912
LUCE, MATTHEW, Cohasset, Mass.....	1920
LUM, EDWARD H., Chatham, N. J.....	1904
LUNN, MISS LULU M., 724 Villa St., Racine, Wis.....	1920
LUNN, MISS MARGARET A., 131 A-B Govt. Hotels, Washington, D. C.....	1919
LYNCH, JOSEPH, 400 Washington St., Perth Amboy, N. J.....	1920
MACKINTOSH, RICHARDS B., 5 Howard Ave., Peabody, Mass.....	1919
MACLAY, MARK W., JR., 106 E. 85th St., New York, N. Y.....	1905
MACCOY, CLINTON V., 1244 Beacon St., Brookline, Mass.....	1920
MACLEAN, MISS MAE, 2116 Evans St., Cheyenne, Wyo.....	1920
MACREYNOLDS, GEORGE, 76 E. State St., Doylestown, Pa.....	1917
MADDOCK, MISS EMELINE, Monte Vista, Philadelphia, Pa.....	1897
MADISON, HAROLD LESTER, Park Museum, Providence, R. I.....	1912
MAGEE, M. J., 603 South St., Sault Ste. Marie, Mich.....	1919
MAHER, J. E., 351 Communipaw Ave., Jersey City, N. J.....	1902
MAIN, FRANK H., Pittsfield, Mass.....	1913
MARBLE, RICHARD M., Woodstock, Vt.....	1907
MARCKRES, GEO. M., Sharon, Conn.....	1918
MARKE, EDWARD SIDNEY, 655 Kearney Ave., Arlington, N. J.....	1915
MARRS, MRS. KINGSMILL, 9 Commonwealth Ave., Boston, Mass.....	1903
MARSHALL, ALFRED, 17 S. Jefferson St., Chicago, Ill.....	1916
*MARSHALL, MRS. ELLA M. O., New Salem, Mass.....	1912
MARTENET, MARK S., Alexander Fertilizer Co., Alexandria, Va.....	1919
MATHEWS, F. SCHUTLER, 17 Frost St., Cambridge, Mass.....	1917
MATTERN, EDWIN S., 1042 Walnut St., Allentown, Pa.....	1912
MAY, FRANKLIN H., 807 E. Adams St., Syracuse, N. Y.....	1920
MAYFIELD, DR. GEORGE R., Kissam Hall, Nashville, Tenn.....	1917
MCCABE, T. T., 6 Thompson St., Annapolis, Md.....	1920
MCCCLINTOCK, NORMAN, 504 Amberson Ave., Pittsburgh, Pa.....	1900
MCCLOSKEY, MISS KATE A., Sup't. Nat. Study in Schools, Saratoga Springs, N. Y.....	1919
MCCONNELL, T. L., 151 Center Ave., Ernsworth, Pittsburgh, Pa.....	1915
MCCOOK, PHILIP J., 413 E. 57th St., New York, N. Y.....	1895
MCGRAW, HARRY A., 1805 15th Ave., Altoona, Pa.....	1917
MCGREW, ALBERT D., 5611 Stanton Ave., Pittsburgh, Pa.....	1917
MCILHENNY, EDWARD AVERY, Avery Island, La.....	1894
MCINTIRE, MRS. HERBERT BRUCE, 4 Garden St., Cambridge, Mass.....	1908
MCLAIN, ROBERT BAIRD, Market and 12th St., Wheeling, W. Va.....	1893
MCLEAN, HON. GEO. P., 1520 New Hampshire Ave., Washington, D. C.....	1913

McLELLAN, Miss MARY E., 2935 Pine Ave., Berkeley, Calif.....	1920
McMILLAN, Mrs. GILBERT N., Gorham, N. H.....	1902
McMULLEN, T. E., 551 Bailey St., Camden, N. J.....	1920
McNEIL, Dr. CHAS. A., Sedalia, Mo.....	1919
McNEIL, GEORGE M., 195 Lincoln St., Winthrop, Mass.....	1920
McPHAIL, FRANK L., 1315 Hill St., Ann Arbor, Mich.....	1920
MEAD, Mrs. E. M., 303 W. 84th St., New York, N. Y.....	1904
MEANS, CHAS. J., 29 Marlborough St., Boston, Mass.....	1912
MEDSGER, OLIVER P., 9 Columbia Ave., Arlington, N. J.....	1919
MELLEN, ELEANOR, M. D., 291 Lake Ave., Newton Highlands, Mass.....	1920
MENGEL, G. HENRY, 739 Madison Ave., Reading, Pa.....	1913
MENNINGER, WM. C., 106 23rd St., Elmhurst, L. I., N. Y.....	1919
MERCUR, J. WATTS, Jr., Wallingford, Pa.....	1920
MERRIAM, HENRY F., 37 Clinton Ave., Maplewood, N. J.....	1905
MERRILL, ALBERT R., Hamilton, Mass.....	1912
MERRILL, D. E., Guthrie Center, Ia.....	1913
MERRILL, HARRY, 316 State St., Bangor, Maine.....	1883
MERRIMAN, R. OWEN, 96 W. 2nd St., Hamilton, Ont.....	1920
*MERSHON, W. B., Saginaw, Mich.....	1905
METCALF, F. P., Biological Survey, Washington, D. C.....	1917
METCALF, Z. P., N. C. State College, West Raleigh, N. C.....	1913
MEYER, Major G. RALPH, 56 C. A. C., Camp Jackson, S. C.....	1913
MEYER, Miss HELOISE, Lenox, Mass.....	1913
MICHAELS, WM. C., 645 W. 56th St., Kansas City, Mo.....	1919
MICKEL, Prof. CLARENCE E., Rocky Ford, Colo.....	1920
MIDDLETON, R. J., Jeffersonville, Pa.....	1920
MILLER, Miss BERTHA STUART, Castone Farm, R. 3, Kingston, N. Y.....	1915
MILLER, Miss CARRIE ELLA, 36 Cottage St., Lewiston, Me.....	1918
MILLER, CHAS. W., Jaffna College, Jaffna, Ceylon.....	1909
MILLER, Mrs. ELISABETH C. T., 1010 Euclid Ave., Cleveland, O.....	1916
MILLS, ENOS A., Estes Park, Colo.....	1916
MILLS, WIER R., Pierson, Iowa.....	1920
MINER, LEO D., 1836 Vernon St., N. W., Washington, D. C.....	1913
MITCHELL, CATHERINE ADAMS, Riverside, Ill.....	1911
MITCHELL, HORACE HEADLEY, Provincial Mus., Regina, Sask.....	1918
MITCHELL, MASON, U. S. Consul, Queenstown, Ireland.....	1916
MITCHELL, Dr. WALTON I., Paonia, Delta Co., Colo.....	1893
MOODY, A. J., c. o. Aetna Life Ins. Co., Hartford, Conn.....	1918
MOODY, Dr. WM. LADD, Newport, R. I.....	1918
MOORE, Mrs. DWIGHT, Cedar Hill, Closter, N. J.....	1920
MOORE, ELIZABETH PUTNAM, North Anson, Me.....	1905
MOORE, WILLIAM H., Mouth Kiswick, Rt. 1, York Co., N. Brunswick.....	1920
MORCOM, G. FREAN, 2906 Pine Ave., Berkeley, Calif.....	1886
MORGAN, BRENT M., 224 11th St., S. W., Washington, D. C.....	1919
MORLEY, S. GRISWOLD, 2535 Etna St., Berkeley, Calif.....	1911

MORLOCK, LOUIS F., Creve Coeur, Mo.....	1919
MORRIS, Miss LUCY N., 90½ Midland Ave., Montclair, N. J.....	1920
MORRISON, ALVA, 3 Shady Hill, Cambridge, Mass.....	1915
MORRON, THADDEUS D., 891 Park St., Hartford, Conn.....	1920
MORROW, Miss EDITH, 255 Mance St., Montreal, Canada.....	1920
MORSE, GEO. F., Jr., Grove Hall, Mass.....	1919
MORSE, HARRY GILMAN, Huron, Ohio.....	1912
MORSE, Miss M. E., 3513 Bloomington Ave., Minneapolis, Minn....	1919
MORSS, CHAS. B., 35 Greanleaf St., Bradford, Mass.....	1918
MOSELEY, Prof. EDWIN LINCOLN, Bowling Green, Ohio.....	1918
MOSES, Mrs. EDMUND QUINCEY, 303 W. 84th St., New York, N. Y. .	1919
MOsher, FRANKLIN H., 17 Highland Ave., Melrose Highlands, Mass.	1905
MOULTON, HERBERT F., 36 W. Main St., Ware, Mass.....	1920
MOUSLEY, WM. HENRY, Hatley, Quebec, Canada.....	1915
MULLEN, JAMES L., 1264 Logan Ave., Salt Lake City, Utah.....	1919
MUNRO, J. A., Okanagan Landing, British Columbia.....	1913
MUNRO, Mrs. WALTER S., 40 N. Main St., So. Norwalk, Conn.....	1920
MURIE, O. J., 219 7th Ave., S., Moorhead, Minn.....	1913
MURPHY, Dr. EUGENE EDMUND, 432 Telfair St., Augusta, Ga.....	1919
MURPHY, EDW. A. C., 94 Prospect St., New Haven, Conn.....	1920
MURPHY, Mrs. GRACE E. B., 73 Muddagh St., Brooklyn, N. Y.....	1919
MURRAY, EDGAR H., 439 Guoin St., Detroit, Mich.....	1919
MUSGRAVE, Mrs. MARK E., Box 765, Phoenix, Ariz.....	1920
MYERS, Mrs. HARRIET W., 311 N. Ave. 66, Los Angeles, Calif.....	1906
MYERS, Miss LUCY F., 127 Academy St., Poughkeepsie, N. Y.....	1898
NAUMAN, E. D., Box 606, Sigourney, Iowa.....	1918
*NEELY, JAMES C., 135 High St., Brookline, Mass.....	1919
NEFF, JOHNSON, Marionville, Mo.....	1919
NEWBERRY, W. F., 233 Broadway, New York, N. Y.....	1920
NEWCOMB, C. A., Jr., Rt. 3, Pontiac, Mich.....	1920
NICE, Mrs. MARGARET M., Norman, Okla.....	1920
NICHOLS, L. NELSON, N. Y. Public Library, New York, N. Y.....	1917
NICHOLS, RODMAN A., 33 Warren St., Salem, Mass.....	1919
NICHOLSON, NEVIN G., 410 Elm St., Grove City, Pa.....	1920
NILES, Mrs. C. F., Hopedale, Mass.....	1920
NIMS, Mrs. LUCIUS, 17 Union St., Greenfield, Mass.....	1913
NINNINGER, Prof. H. H., McPherson College, McPherson, Kan.....	1920
NOBLE, ELEANOR G., 66 Sparks St., Cambridge, Mass.....	1916
NOBLE, G. KINGSLEY, Am. Mus. Nat. Hist., New York, N. Y.....	1916
NOKES, Dr. I. D., 1800 So. Van Ness Ave., Los Angeles, Calif.....	1915
NOLTE, Rev. FELIX, St. Benedict's College, Atchison, Kan.....	1903
NORRIS, EDWARD, 301 W. Springfield Ave., Philadelphia, Pa.....	1916
NORRIS, J. PARKER, Jr., 2122 Pine St., Philadelphia, Pa.....	1904
NORTON, Mrs. CARRIE MORSE, Faulkton, S. Dak.....	1918
NOTT, Miss ETHEL A., 309 S. Pine St., Reedsburg, Wis.....	1920

NUGENT, JAMES R., 772 Broad St., Newark, N. J.....	1920
OGDEN, DAVID B., 23 Alton Place, Brookline, Mass.....	1920
OGDEN, DR. HENRY VINING, 141 Wisconsin St., Milwaukee, Wis.....	1897
OLDYS, HENRY, Silver Springs, Md.....	1896
ONDESCO, Miss MARY E., Gardner, Ill.....	1920
O'ROARK, Mrs. L. S., R. 2, Mt. Kemble, Morristown, N. J.....	1919
OSBORN, Prof. HENRY F., Am. Mus. Nat. Hist., New York, N. Y....	1919
OSBORNE, ARTHUR A., 183 Lowell St., Peabody, Mass.....	1912
OSLER, H. S., 1 Rosedale Road, Toronto, Ont.....	1920
OTTEMILLER, FREE, 752 S. George St., York, Pa.....	1914
OVERTON, DR. FRANK, Patchogue, N. Y.....	1909
*OWEN, Miss JULIETTE AMELIA, 306 N. 9th St., St. Joseph, Mo.....	1897
PACKARD, WINTHROP, 1442 Washington St., Canton, Mass.....	1917
PAINE, AUGUSTUS G., Jr., 31 E. 69th St., New York, N. Y.....	1886
PAINE, CHARLES JACKSON, 705 Sears Bldg., Boston, Mass.....	1917
PAINTER, KENYON V., 3240 Fairmount Blvd., Cleveland, Ohio.....	1920
*PALMER, Miss E. D., 1741 S. Harvard Blv'd., Los Angeles, Calif. .	1918
PALMER, R. H., Dept. Geol., Univ. Washington, Seattle, Wash.....	1917
PALMER, DR. SAMUEL C., 712 Ogden Ave., Swarthmore, Pa.....	1899
PALMER, Mrs. T. S., 1939 Biltmore St., N. W., Washington, D. C. .	1918
PANGBURN, CLIFFORD H., 2797 Morris Ave., New York, N. Y.....	1907
PARKER, ARTHUR JOHN, So. Lincoln, Mass.....	1920
*PARKER, EDWARD LUDLOW, Nashawtuc Rd., Concord, Mass.....	1916
PARKER, HERBERT, So. Lancaster, Mass.....	1920
PATTEN, DR. STEPHEN K., 141 Milk St., Boston, Mass.....	1920
PAUL, LUCIUS H., 436 Carter St., Rochester, N. Y.....	1908
PAXTON, Mrs. REGINA A., 59 Walmer Road, Toronto, Ontario.....	1917
PEABODY, Rev. P. B., Blue Rapids, Kan.....	1903
PELLEW, Miss M. J., 1637 Mass. Ave., N. W., Washington, D. C. .	1919
PEMBERTON, JOHN ROY, Box 1112, Tulsa, Okla.....	1918
PENNELL, Miss ELIZABETH A. S., 252 Maine St., Brunswick, Me.....	1918
PENNINGTON, WM. DANA, 1722 4th St., Washington, D. C.....	1919
*PENROSE, DR. CHAS. BINGHAM, 1720 Spruce St., Philadelphia, Pa....	1919
PEPPER, DR. WM., 1813 Spruce St., Philadelphia, Pa.....	1911
PERINE, KEBLE, 26 Trull St., Dorchester, Mass.....	1917
PERKINS, DR. ANNE E., Gowanda Hospital, Collins, N. Y.....	1917
PERKINS, ARTHUR W., 21 High St., Farmington, Me.....	1915
PERKINS, EDW. H., Box 52, Waterville, Me.....	1920
PERKINS, DR. GEORGE H., Univ. of Vt., Burlington, Vt.....	1912
PERRY, DR. HENRY JOSEPH, 45 Bay State Road, Boston, Mass.....	1909
PETERS, ALBERT S., Lake Wilson, Minn.....	1908
PETERSON, ALFRED, Pipestone, Minn.....	1920
PETTY, ORVILLE A., Chapel St. & Sherman Ave., New Haven, Conn.	1919
PHELPS, FRANK M., 212 E. 4th St., Elyria, Ohio.....	1912
PHELPS, Mrs. J. W., Box 36, Northfield, Mass.....	1899

PHELPS, WARREN A., 19 Tennyson Ave., Pittsfield, Mass.....	1920
PHILIPP, PHILIP B., 220 Broadway, New York, N. Y.....	1907
PHILLIPS, ALEXANDER H., 54 Hodge Road, Princeton, N. J.....	1891
PHILLIPS, CHAS. LINCOLN, 5 West Weir St., Taunton, Mass.....	1912
PHILLIPS, CHAS. P., Univ. Minn., Minneapolis, Minn.....	1919
*PHILLIPS, JOHN M., 2227 Jane St., Pittsburgh, Pa.....	1920
PIERCE, WRIGHT McEWEN, Box 343, Claremont, Calif.....	1918
PILSBURY, FRANK O., 1088 Main St., Walpole, Mass.....	1917
PINCOT, GIFFORD, Real Estate Trust Bldg., Philadelphia, Pa.....	1910
PINKUS, ALBERT S., 10 Fairfield Ave., Hartford, Conn.....	1919
PIRNIE, MILES D., McGraw Hall, Ithaca, N. Y.....	1919
PLATT, HON. EDMUND, 2339 Ashmead Place, Washington, D. C.....	1917
POE, MISS MARGARETTA, 1204 N. Charles St., Baltimore, Md.....	1899
POMEROY, F. E., Bates College, Lewiston, Me.....	1920
POOLE, EARL L., School Admin. Bldg., Reading, Pa.....	1916
POPE, ALEXANDER, 1013 Beacon St., Brookline, Mass.....	1919
POPE, E. F., Box 113, El Reno, Okla.....	1920
PORTER, LOUIS H., Stamford, Conn.....	1893
POST, WILLIAM S., Bernardsville, N. J.....	1911
POTTER, JULIAN K., 563 Bailey St., Camden, N. J.....	1912
POTTER, LAWRENCE B., Eastend, Sask.....	1919
POWERS, MISS EVA L., Greenwich Village, R. D., Mass.....	1920
PRAEGER, WILLIAM E., 421 Douglas Ave., Kalamazoo, Mich.....	1892
PRATT, HON. GEO. D., Telephone Bldg., Albany, N. Y.....	1917
PRICE, JOHN HENRY, Crown W Ranch, Knowlton, Mont.....	1906
PRICE, LIGON, Marlinton, W. Va.....	1913
PRITCHARD, MRS. F. A., 203 N. Court St., Medina, Ohio.....	1918
PROCTOR, GEORGE N., 35 Congress St., Boston, Mass.....	1919
PURDY, JAMES B., R. F. D. 1, Plymouth, Mich.....	1893
QUARLES, EMMET AUGUSTUS, 139 E 7th St., Plainfield, N. J.....	1918
QUILLIN, ROY W., 1025 Summit Ave., San Antonio, Tex.....	1920
RAKER, MISS MARY E., 1484 E. Sherman St., Portland, Ore.....	1918
RAND, MRS. HARRY SEATON, 1899 Mass. Ave., Cambridge 13, Mass.....	1920
RATLIFF, HON. WALTER S., R. R. B., Box 276, Richmond, Ind.....	1918
RAVEN, HENRY CUSHIER, Bayshore, N. Y.....	1918
RAYMOND, MISS BESSIE, 564 Diagonal Road, Akron, Ohio.....	1920
REA, PAUL M., Lennox Bldg., Cleveland, Ohio.....	1912
REAGH, DR. ARTHUR LINCOLN, 39 Maple St., West Roxbury, Mass.....	1896
REED, MRS. BESSIE, 1609 Vermont St., Lawrence, Kan.....	1920
REED, MISS CLARA EVERETT, Brookfield, Mass.....	1919
REESE, MRS. ROBT. M., 3016 Dumbarton Ave., N. W., Wash'ton, D. C.....	1920
REGAR, H. SEVERN, 1400 De Kalb St., Norristown, Pa.....	1916
REHN, JAMES A. G., 6033 B Catherine St., Philadelphia, Pa.....	1901
REICHENBERGER, MRS. VICTOR M., Hotel Essex, New York, N. Y.....	1916
REID, MRS. BRUCE, Gulf Refinery, Port Arthur, Tex.....	1918

REID, RUSSELL, 722 5th St., Bismarck, N. Dak.	1919
RETT, EGMONT Z., 3060 Larimer St., Denver, Colo.	1917
RHOADS, CHARLES J., 1914 S. Rittenhouse Sq., Philadelphia, Pa.	1895
RICE, HARRY L., 10 High St., Boston, Mass.	1920
RICE, Miss HELEN M., Holton Arms School, 2125 S. St., N. W., Washington, D. C.	1920
RICE, JAMES HENRY, JR., Brick House Plantation, Wiggins, S. C.	1910
RICE, WARD J., Roachdale, Ind.	1913
RICHARDS, Miss HARRIET E., 36 Longwood Ave., Brookline, Mass.	1900
RICHARDSON, JENNESS, Zoöl. Mus. Univ. Minn., Minneapolis, Minn.	1920
RICHARDSON, W. D., 4215 Prairie Ave., Chicago, Ill.	1917
RIDGWAY, JOHN L., Chula Vista, San Diego Co., Calif.	1890
RIES, DONALD T., 401 Thurston Ave., Ithaca, N. Y.	1920
RIS, PAUL P., 301 Shaw St., Rockford, Ill.	1920
RIKER, CLARENCE B., 43 Scotland Road, South Orange, N. J.	1885
ROBBINS, CHARLES A., Onset, Mass.	1914
ROBERTS, PREWITT, Conway, Mo.	1919
ROBERTS, WILLIAM ELY, 207 McKinley Ave., Lansdowne, Pa.	1902
ROBERTSON, HOWARD, 157 S. Wilton Drive, Los Angeles, Calif.	1911
ROBERTSON, JOHN MCB., Box 121, Buena Park, Orange Co., Calif.	1920
ROBINSON, ANTHONY W., Haverford, Pa.	1903
ROBINSON, Mrs. L. K., 1130 S. Franklin St., Denver, Colo.	1919
ROBINSON, Miss MARY L., Lathrop Trade School, Kansas City, Mo.	1919
*ROGERS, CHAS. H., Nassau Inn, Princeton, N. J.	1904
ROLAND, CONRAD K., 1208 DeKalb St., Norristown, Pa.	1917
ROOSEVELT, FRANKLIN DELANO, Hyde Park, N. Y.	1896
ROSE, GEORGE C., Ellenville, N. Y.	1920
ROSS, GEO. H., 23 West St., Rutland, Vt.	1904
ROSS, Dr. LUCRETIOUS H., 507 Main St., Bennington, Vt.	1912
ROUSH, GEO. HAROLD, 48 Stewart St., Morgantown, W. Va.	1919
ROWAN, Prof. WILLIAM, Univ. of Alberta, Edmonton, Alta.	1920
RUGG, HAROLD GODDARD, Dartmouth College, Hanover, N. H.	1919
RUST, HENRY J., Coeur d'Alene, Idaho.	1918
RYDER, Mrs. ROBERT O., 1041 Franklin Ave., Columbus, Ohio.	1919
SACKETT, CLARENCE, Rye, N. Y.	1910
SAGE, HENRY M., Menands Road, Albany, N. Y.	1885
SAGE, Mrs. MARY SEARL, 1974 Broadway, New York, N. Y.	1919
SALYER, J. CLARK, 2412 Main St., Lexington, Mo.	1919
SAMPSON, Dr. JOHN A., 180 Washington Ave., Albany, N. Y.	1920
SANBORN, COLIN C., P. O. Box 55, Chicago, Ill.	1911
SANDERSON, Miss EVA E., 729 Dedham St., Newton Center, Mass.	1920
*SANFORD, Dr. LEONARD C., 216 Crown St., New Haven, Conn.	1919
SANTENS, REMI H., Carnegie Mus., Pittsburgh, Pa.	1918
SATTERTHWAIT, Mrs. A. F., 118 Waverly Place, Webster Groves, Mo.	1920
SAVAGE, JAMES, 1097 Ellicott Sq., Buffalo, N. Y.	1895

SAVAGE, MAHLON L., 1338 Orthodox St., Frankford, Philadelphia, Pa.	1919
SAWYER, C. J., 22 Lincoln St., Hudson, Mass.	1920
SCHAEFFER, OSCAR FREDERICK, 669 Genesee St., Rochester, N. Y.	1916
SCHAFER, J. J., Port Byron, Ill.	1918
SCHANTZ, ORPHEUS M., 5215 W. 24th St., Cicero, Ill.	1919
SCHLEICHERT, ERNEST K., Mathias Point, Va.	1919
SCHNEIDER, MRS. ELIZABETH, 261 Broadway, Methuen, Mass.	1920
SCHONNEGEL, JULIAN ELIOT, 92 Morningside Ave., New York, N. Y.	1918
SCHORGER, A. W., 2021 Kendall Ave., Madison, Wis.	1913
SCHRENCK, DR. HERMANN VON, 4139 McPherson Ave., St. Louis, Mo.	1919
SCHRODER, HUGO H., 303 E. State St., Bettendorf, Iowa.	1920
SCOVILLE, SAMUEL, JR., 415 Lancaster Ave., Haverford, Pa.	1916
SCUDDER, DR. WALTER H., Litchfield, Medina Co., Ohio.	1920
SEARS, WILLIAM R., 73 Tremont St., Boston, Mass.	1916
SEELEY, GEORGE H., Box 106, Stockbridge, Mass.	1920
SERRILL, WILLIAM J., Haverford, Pa.	1916
SHA, ROY H., 1607 Irving St., N. W., Washington, D. C.	1920
SHAW, HENRY S., 78 Cypress St., Newton Center, Mass.	1916
SHAW, DR. J. E. NORTON, Mattapoisett, Mass.	1919
SHAW, WILLIAM T., 1000 Thatuna St., Pullman, Wash.	1908
SHEA, DANIEL W., Catholic Univ. of Amer., Washington, D. C.	1917
SHELDON, CHARLES, 3102 Q St., N. W., Washington, D. C.	1911
SHELDON, H. H., Commercial Tr. Bank, Santa Barbara, Calif.	1919
SHELLEY, F. L., Elmdale, Kan.	1918
SHELTON, ALFRED C., c. o. Johnson, Shelton Co., Dayton, Ohio.	1911
SHERWOOD, MRS. THEODORE C., 3520 Cherry St., Kansas City, Mo.	1919
SHIRLEY, LESTER L., 144 Buntin St., Vincennes, Ind.	1917
SHIRLING, ALBERT E., 3849 E. 62nd St., Kansas City, Mo.	1919
SHOEMAKER, CLARENCE R., 3116 P St., Washington, D. C.	1910
SHOEMAKER, HENRY W., McElhattan, Pa.	1912
SHOFFNER, CHAS. P., 17 Rolling R d, Springfield, Pa., (Rt. 3.) Media	1915
SHROEDER, MRS. A. P., Texsam, S. Dak.	1920
SHUMWAY, FRANK R., 100 Brunswick St., Rochester, N. Y.	1920
SILLIMAN, O. P., Cor. Alisal & Riker St., Salinas, Calif.	1915
SILVER, JOHN A., Aberdeen, Md.	1918
SIMONS, C. DEWAR III, Dongan Hills, Staten I., N. Y.	1920
SIMMONS, GEORGE FINLAY, Univ. of Texas, Austin, Tex.	1910
SKINNER, M. P., Yellowstone Park, Wyo.	1916
SLEEPER, LAWRENCE, 198 St. Paul St., Brookline, Mass.	1920
SMITH, AUSTIN PAUL, Cartago, Costa Rica.	1911
SMITH, CHARLES E., 261 New Boston Road, Fall River, Mass.	1920
SMITH, MRS. FLORENCE, Box 145, Cincinnati, N. Y.	1920
SMITH, REV. FRANCIS CURTIS, 820 Genesee St., Utica, N. Y.	1903
SMITH, PROF. FRANK, 1005 West California Ave., Urbana, Ill.	1909
SMITH, HORACE G., 2918 Lafayette St., Denver, Colo.	1888

SMITH, DR. HUGH M., 1209 M St., N. W., Washington, D. C.....	1886
SMITH, JESSE L., 141 So. 2nd St., Highland Park, Ill.....	1920
SMITH, LESTER W., 60 Cottage St., Meriden, Conn.....	1916
SMITH, Miss LOTTIE M., R. F. D. Box 6, So. Sudbury, Mass.....	1920
SMITH, THOMAS, 124 Howe St., Methuen, Mass.....	1920
SMITH, Mrs. WALLIS C., 525 N. Michigan Ave., Saginaw, W. S., Mich.....	1916
SMITH, WENDELL PHILLIPS, Wells River, Vt.....	1919
SMYTH, Prof. ELLISON A., Jr., Polytechnic Inst., Blacksburg, Va.....	1892
SNYDER, ELIAS LeROY, 1244 N. Emporia Ave., Wichita, Kan.....	1919
SNYDER, LESTER L., Royal Ont. Mus., Toronto, Ont.....	1919
SNYDER, WILL EDWIN, 309 DeClark St., Beaver Dam, Wis.....	1895
SPELMAN, HENRY M., 48 Brewster St., Cambridge, Mass.....	1911
SPENCER, Miss C. S., Dept. of Zoöl., Coe College, Cedar Rapids, Ia.....	1917
SPERRY, CHARLES C., Biological Survey, Washington, D. C.....	1920
SPRAGUE, ISAAC, Wellesley Hills, Mass.....	1920
STACKPOLE, FRED H., 120 Wellington Hill St., Mattapan, Mass.....	1920
STANWOOD, Miss CORDELIA JOHNSON, Ellsworth, Me.....	1909
STAPLETON, RICHARD, 219 High St., Holyoke, Mass.....	1916
STEELE, HENRY B., 4530 Drexel Boulevard, Chicago, Ill.....	1917
STEPHENSON, Mrs. JESSE, Monte Vista, Colo.....	1918
STEVENS, Prof. G. W., Normal College, Warrensburg, Mo.....	1919
STEVENS, Dr. J. F., Box 1546, Lincoln, Neb.....	1908
STEWART, Mrs. CECIL, 451 Beacon St., Boston, Mass.....	1917
STILES, EDGAR C., 345 Main St., West Haven, Conn.....	1907
STIMSON, Dr. ARTHUR M., 414 Raymond St., Chevy Chase, Md.....	1917
STODDARD, HERBERT L., Milwaukee Public Mus., Milwaukee, Wis....	1912
STONE, Mrs. FRANCIS H., So. Dartmouth, Mass.....	1920
STONE, HARRY HERBERT, Jr., Sturbridge, Mass.....	1919
STONE, Mrs. WITMER, 5044 Hazel Ave., Philadelphia, Pa.....	1920
STORER, TRACY IRWIN, Mus. Vert. Zoölogy, Berkeley, Calif.....	1916
STORRE, Mrs. JAMES J., Lincoln, Mass.....	1920
STRATTON, Mrs. GEORGE W., 439 Rebecca Ave., Wilkinsburg, Pa....	1920
STREET, J. FLETCHER, Beverly, N. J.....	1908
STREUTERS, Rev. ALFRED L., Townsend, Mass.....	1918
STUART, FRANK A., 118 Green St., Marshall, Mich.....	1915
STUART, GEO. H., 3rd, c. o. Girard Trust Co., Philadelphia, Pa.....	1913
STURGIS, S. WARREN, Groton, Mass.....	1910
STURTEVANT, EDWARD, St. George's School, Newport, R. I.....	1896
SUGDEN, ARTHUR W., 35 Concord St., Hartford, Conn.....	1913
SUMNER, Mrs. GRAHAM, Linden Ave., Englewood, N. J.....	1920
SUTTON, GEO. MIKSCHE, Carnegie Mus., Pittsburgh, Pa.....	1919
SWAIN, JOHN MEERTON, 113 Main St., Farmington, Me.....	1899
SWENEY, J. A., Forest Service, Nenzel, Neb.....	1916
SWEET, Miss ORA D., 34 Elizabeth St., Auburn, N. Y.....	1919
SWIFT, JOSEPH B., 46 Mattapan St., Boston, Mass.....	1920

TALBOT, L. R., 509 Audubon Road, Boston, Mass.....	1920
TATNALL, SAMUEL A., 503 Hansberry St., Philadelphia, Pa.....	1916
TAYLOR, ALEXANDER R., Coyce, S. C.....	1907
TAYLOR, HORACE, 3 Netherlands Rd., Brookline, Mass.....	1917
TAYLOR, LIONEL E., Bankhead, Kelowna, B. C.....	1913
TAYLOR, Dr. WALTER P., c. o. Scripps Institute, La Jolla, Calif.....	1916
TAYLOR, WARNER, 219 Clifford Court, Madison, Wis.....	1916
TEACHENOR, DIX, 510 Rialto Bldg., Kansas City, Mo.....	1919
TERRELL, CLYDE B., 83 Monument Sq., Oshkosh, Wis.....	1920
TERRILL, LEWIS Mcl., 44 Stanley Ave., St. Lambert, Quebec.....	1907
TERRY, Miss ALICE P., 89 State St., New Bedford, Mass.....	1920
TERRY, ROBERT J. M. D., 5315 Delmar Ave., St. Louis, Mo.....	1919
TEST, Dr. FRED'K C., 4620 Greenwood Ave., Chicago, Ill.....	1920
THABES, Mrs. J. A., 417 Holly St., Brainerd, Minn.....	1920
THOMAS, GERALD B., Box 1124, Billings, Mont.....	1919
THOMPSON, J. W., 527 East First South St., Salt Lake City, Utah....	1916
THOWLESS, HERBERT L., 765 Broad St., Newark, N. J.....	1919
TINDALL, CHAS. W., 912 N. Noland St., Independence, Mo.....	1919
TINKER, ALMERIN D., 1019 Church St., Ann Arbor, Mich.....	1907
TOMLINSON, IRVING C., 1249 Little Bldg., Boston, Mass.....	1920
TORREY, Miss EDITH E., 164 Huntington Ave., Boston, Mass.....	1920
TOWER, Mrs. KATE D., Hotel Bristol, Copley Sq., Boston, Mass....	1908
TOWNE, Miss ANNIE FLORENCE, Topsfield, Mass.....	1918
TOWNE, Dr. SOLON RODNEY, Sta. D., Route 2, Omaha, Neb.....	1919
TOWNSHEND, HENRY H., 35 Hellbourne Ave., New Haven, Conn....	1915
TREAT, WILLARD ELLERY, Silver Lane, Conn.....	1919
TREGANZA, A. O., 522 S. 13th St., E. Salt Lake City, Utah.....	1906
TROTTER, WILLIAM HENRY, 36 N. Front St., Philadelphia, Pa.....	1899
TRUESDELL, JOHN F., 230 Post Office Bldg., Denver, Colo.....	1918
TRULL, HARRY S., 24 Claremont Ave., Mt. Vernon, N. Y.....	1917
TRUMBELL, J. H., Plainville, Conn.....	1907
TUDBURY, WARREN C., 1939 Marin Ave., Berkeley, Calif.....	1903
TUFTS, ROBBIE W., Wolfville, Nova Scotia.....	1919
TULLOCK, Mrs. GILBERT, 379 Edgewood Ave., New Haven, Conn....	1919
TURNER, WARREN H., 16 Greendale Ave., Worcester, Mass.....	1920
TUTTLE, HENRY EMERSON, Groton School, Groton, Mass.....	1909
TUTTLE, Mrs. F. MAY, 1114 State St., Osage, Iowa.....	1920
TWITCHELL, A. H., Flat, Alaska.....	1918
TYLER, JOHN G., Box 173, Fresno, Calif.....	1912
UFFORD, Dr. EUGENE V., 231 Central St., Auburndale, Mass.....	1918
UNDERWOOD, Wm. LYMAN, Mass Inst. of Tech., Cambridge, Mass....	1900
URNER, CHARLES A., 613 Cleveland Ave., Elizabeth, N. J.....	1920
VALENTINE, Miss ANNA J., Bellefonte, Pa.....	1905
VALLANDINGHAM, Miss KATIE, 811 Highland Ave., Carrollton, Ky....	1918
*VANDERGRIFF, S. H., 311 Riggs Bldg., Washington, D. C.....	1918

VAN FLEET, CLARK C., 446 10th St., Santa Rosa, Calif.....	1919
VAN NAME, WILLARD G., Am. Mus. Nat. Hist., New York, N. Y....	1900
VAN NEMAN, Miss LOULA, Westport High School, Kansas City, Mo..	1919
VARICK, Dr. WM. REMSEN, 875 Elm St., Manchester, N. H.....	1920
VETTER, Dr. CHARLES, 67 West 12th St., New York, N. Y.....	1898
VIERECK, HENRY L., Biological Survey, Washington, D. C.....	1916
VORHIES, Dr. CHAS T., Univ. of Ariz., Tucson, Ariz.....	1918
WADSWORTH, CLARENCE S., 27 Washington St., Middletown, Conn..	1906
WALKER, EDITH F., 614 County St., New Bedford, Mass.....	1920
WALKER, EGBERT HAMILTON, 411 Camden Court, Ann Arbor, Mich..	1919
WALKER, ERNEST P., Juneau, Alaska.....	1918
WALKER, GEO. R., R. D. 3, Murray, Utah.....	1909
WALLACE, CHAS. R., 69 Columbus Ave., Delaware, Ohio.....	1913
WALLACE, JAMES S., 12 Wellington St., E. Toronto, Ontario.....	1907
WALTER, Dr. HERBERT E., 67 Oriole Ave., Providence, R. I.....	1901
WALTERS, FRANK, 125 23rd St., Elmhurst, N. Y.....	1902
WARD, FRANK H., 18 Grove Place, Rochester, N. Y.....	1908
WARD, HENRY L., 520 Lake Drive, Milwaukee, Wis.....	1906
WARNER, EDWARD P., Langley Field, Hampton, Va.....	1910
WATERMAN, WILLARD H., Auburn, Me.....	1920
WATSON, C. G., 201 Ridout St., S., London, Ont.....	1919
WATSON, LUCIUS H., 4123 Sheridan Blv'd, Lincoln, Neb.....	1920
WEBER, J. A., Moore and Grand Aves., Leonia, N. J.....	1906
WEBSTER, Dr. GEORGE A., Roxbury, Mass.....	1916
WEBSTER, Mrs. JENNIE E. B., 44 E. 23rd St., New York, N. Y....	1917
WEEKS, Rev. LeROY TITUS, Emmetsburg, Iowa.....	1917
WEEKES, CHARLES H., Harwich, Mass.....	1920
WEISEMAN, T. WALTER, 226 Beaver Road, Emsworth, Pa.....	1919
WEISER, CHARLES S., 105 W. Springettsbury Ave., York, Pa.....	1916
WELLAR, Miss GLADYS E., 123 Dryden Rd., Ithaca, N. Y.....	1920
*WELLMAN, GORDON B., 46 Dover R'd., Wellesley, Mass.....	1908
WEST, CHAS. SLADE, Marianna, Fla.....	1919
WETMORE, Mrs. EDMUND H., Babylon, N. Y.....	1902
WEYGANDT, Dr. CORNELIUS, 6635 Wissahickon Ave., Philadelphia, Pa.	1907
*WHARTON, WILLIAM P., Groton, Mass.....	1907
WHEELER, Rev. HARRY EDGAR, Fayetteville, Ark.....	1919
WHEELER, Mrs. JAMES W., 403, 15th Ave., N., Seattle, Wash.....	1918
WHITAKER, J. R., Grand Lake, Newfoundland.....	1919
WHITE, DONALD, 21 A, Sweetser St., Wakefield, Mass.....	1920
WHITE, FRANCIS BEACH, St. Paul's School, Concord, N. H.....	1891
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WHITNEY, GEOFFREY G., Milton St., Readville 37, Mass.....	1920

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*WIGGLESWORTH, Dr. EDW., Boston Soc. Nat. Hist., Boston, Mass....	1920
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WILCOX, T. FERDINAND, 118 E. 54th St., New York, N. Y.....	1895
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WILLIAMSON, E. B., Bluffton, Ind.....	1900
WILLIS, Miss CLARA L., 72 Main St., Framingham Center, Mass...	1915
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WILLWARTH, E. S., 11 Lincoln Hall, Trinity Court, Boston 17, Mass.	1920
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WILSON, Mrs. ETTA S., 9077 Clarendon Ave., Detroit, Mich.....	1917
WILSON, GORDON, 1434 Chestnut St., Bowling Green, Ky.....	1919
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WRIGHT, Miss HARRIET H., 1637 Gratiot Ave., Saginaw. W. S., Mich.	1907
*WRIGHT, Miss MARY A., 42 Quincy St., Cambridge, Mass.....	1920
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Old
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CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

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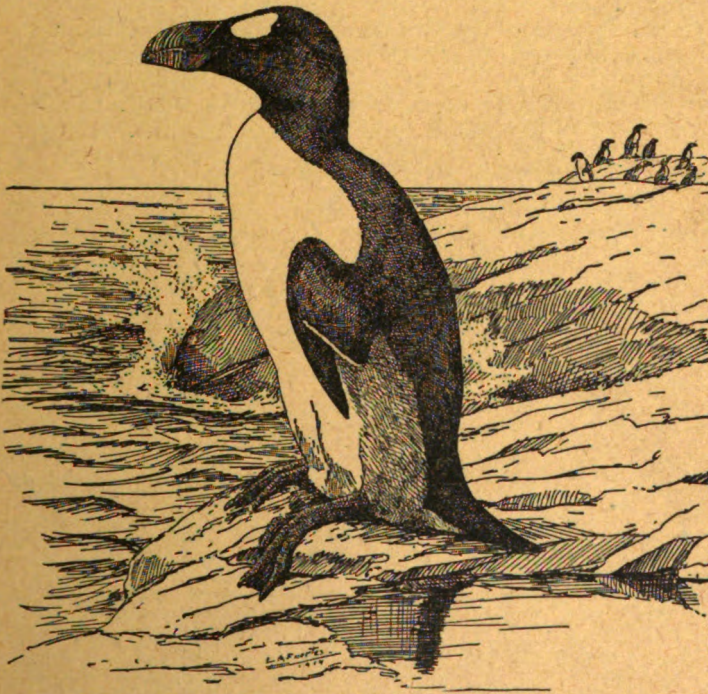
The Auk

A Quarterly Journal of Ornithology

Vol. XXXVIII

JANUARY, 1921

No. 1



PUBLISHED BY

The American Ornithologists' Union

LANCASTER, PA.

Entered as second-class mail matter in the Post Office at Lancaster, Pa.

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ORNITHOLOGY.

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No. 1

THE DICKCISSEL (*SPIZA AMERICANA*) OF THE ILLINOIS PRAIRIES.

BY ALFRED O. GROSS, PH. D.

Plates I-IV.

I. INTRODUCTION.

To one who journeys along the dusty roads of Central Illinois on a hot summer day, there is nothing that relieves the quiet monotony of the sunny open landscape more than the earnest, incessant calls of the Dickcissel. Even the farmer and the layman, whose chief interests may be in the dollars and cents of the productive grain fields, cannot fail to have their attention attracted by this bird as it loudly and lustily announces its presence. The clear accented notes of the monotonous song at once suggest the bird's common name—Dickcissel. In the middle west it is popularly and generally known as the "Little Meadowlark," a name that has arisen because of its resemblance in miniature to the common Meadowlark. Indeed, some very intelligent farmers believe the Dickcissels to be merely small individuals of the larger and well known bird. The name Black-throated Bunting, so often met with in the writings of the older authors, is now less used by bird students. By the typical westerner who knows the Dickcissel intimately, he is often referred to as "Dick."

The Dickcissel contributes not only its beauty and song to its environment but does its bit in the economy of nature by consuming scores of destructive insects, as well as hundreds of seeds of obnoxious weeds, harmful to the crops. In Central Illinois where the Dickcissel is at its best, it ranks among the most abundant and important birds from an economic point of view. The ornithological writings contain many notes pertaining to the distribution of the Dickcissel, but very little has been contributed on the life history of this interesting and important bird, which deserves better and more general recognition. For this reason the author feels that no apology is necessary in presenting the results of this study.

Most of the notes on the life history, behavior, etc., were obtained from a study of birds and nests found on the farm of C. W. Wilson, and adjoining farms, near the village of Atwood, Douglas County, Illinois, during the summer of 1918. Records made by the author while conducting the field work of a statistical bird survey of Illinois in 1906-1907 and 1909 are also included.

The author wishes to express his thanks to Prof. S. A. Forbes for the use of the Illinois State Laboratory records, from which the statistical tables in the third division of this paper were compiled; to Prof. Frank Smith, of the University of Illinois, and to Mr. T. E. Musselman, of Quincy, Illinois, for the use of their excellent records of migrations; to Mr. E. R. Kalmbach, of the U. S. Bureau of Biological Survey, and Mr. A. N. Caudell, of the U. S. Bureau of Entomology, for the determination of plant and animal matter found in the stomachs and crops of the birds; to the Museum of Comparative Zoölogy, Cambridge, for the loan of its series of Dickcissel skins; and to Dr. E. L. Mark for reading and correcting the manuscript.

II. GEOGRAPHICAL RANGE.

The nesting range of the Dickcissel is now limited chiefly to the region of the middle west between the Alleghanies and the Rocky Mountains and from Michigan¹,² Wisconsin,³ Minnesota,³,⁴ and

¹ Gibbs, Dr. Morris. 1879, Bull. U. S. Geol. and Geog. Surv. Terr., vol. 5, p. 487.

² Barrows, W. B. 1912. Michigan Bird Life, pp. 537-539.

³ Cooke, W. W. 1888, U. S. Dept. of Agr. Bull., no. 2, pp. 220-221.

⁴ Roberts, T. S., and Benner, F. 1880, Bull. Nutt. Orn. Club, vol. 5, p. 15.

North Dakota,⁵ south to Alabama,⁷ Mississippi,⁸ Louisiana,⁹, ¹⁰ and Texas¹¹, ¹², ¹³, ¹⁴ casually straying as far west as Arizona,¹⁵, ¹⁶, ¹⁷ New Mexico and California.¹⁷ There is a nesting record as far north as Point Pelee, Ontario, June 1, 1884,¹⁸ but I know of no recent reports of this bird breeding north of the 47th parallel and nests above 43° latitude are rare. Audubon¹⁹ in 1838 stated that the Dickcissel was rare in Ohio and scarce in Kentucky, but today it is not uncommon in the western sections of these two states. Prof. A. B. Brooks reports seeing a pair of Dickcissels on July 5-8, 1907, at Buchannon, Upshur County, West Virginia. It is now abundant and, according to numerous reports, is apparently becoming more so throughout Indiana, Illinois, Missouri, Iowa, Kansas, Nebraska and South Dakota. It breeds in the plains east of the mountains of Colorado²⁰, ²¹ and Wyoming.¹⁷ One pair of supposedly breeding birds has recently been reported from Wahpeton, North Dakota.⁶

In the time of Alexander Wilson²² the Dickcissel was a common summer resident east of the Alleghany Mountains and even in the latter part of the nineteenth century, not more than thirty to forty years ago, there were many records of its occurrence and of its nesting along the Atlantic seaboard. Its breeding range extended from South Carolina²³ up through Pennsylvania,¹⁹, ²⁴, ²⁵

⁵ Allen, J. A. 1874, Proc. Bost. Soc. N. H., vol. 17, pp. 12, 29 and 59.

⁶ Jensen, J. K. 1918, Auk, vol. 35, p. 348.

⁷ Golsan, L. S., and Holt, E. G. 1914, Auk, vol. 31, p. 229.

⁸ Hay, O. P. 1882, Bull. Nutt. Orn. Club, vol. 7, p. 92.

⁹ Allison, A. 1904, Auk, vol. 21, pp. 472-484.

¹⁰ Kopman, H. H. 1915, Auk, vol. 32, p. 28.

¹¹ Dresser, H. E. 1865, Ibis, vol. 1, new series, p. 490.

¹² Attwater, H. P. 1892, Auk, vol. 9, p. 339.

¹³ Sennett, Geo. B. 1879, Bull. U. S. Geol. and Geog. Surv. Terr., vol. 5, p. 392.

¹⁴ Simmons, G. F. 1915, Auk, vol. 32, p. 329.

¹⁵ Henshaw, H. W. 1873, Rep. Orn. Spec. Wheeler's Survey, p. 119.

¹⁶ Scott, W. E. D. 1887, Auk, vol. 4, pp. 196-205.

¹⁷ Bailey, F. M. 1904, Handbook of Birds of Western U. S., p. 377.

¹⁸ Saunders, W. E. 1885, Auk, vol. 2, pp. 307-308.

¹⁹ Audubon, J. J. 1838, Ornith. Biog., vol. 4, pp. 579-580.

²⁰ Cooke, W. W. 1898, Bull. Colo. Agric. Col., p. 167.

²¹ Ridgway, R. 1873, Bull. Essex Inst., vol. 5, pp. 183-195.

²² Wilson, A. 1811, Amer. Ornith., vol. 3, p. 86.

²³ Loomis, L. M. 1885, Auk, vol. 2, p. 192; and 1891, Auk, vol. 8, p. 168.

²⁴ Rhoads, S. N. 1903, Cassin's, VIII, pp. 17-28.

²⁵ Trotter, S. 1879, Bull. Nutt. Orn. Club, vol. 4, p. 235.

New Jersey^{24, 26, 27} and New York^{28, 29, 30} to Rhode Island³¹ and Massachusetts.^{19, 22, 23, 24} Stragglers of the Dickcissel have been collected as far south as Florida^{32, 36} and as far north and east as New Hampshire,⁴⁰ Maine,^{37, 38, 39} and Nova Scotia.⁴¹ The last record of its nesting east of the Alleghanies, so far as I know, is that of W. DeW. Miller,²⁶ who found a nest at Plainfield, New Jersey, on July 3, 1904. The Dickcissel now seems destined to become eliminated as a breeding bird in the eastern section of its former range if it is not so already. S. N. Rhoads,²⁴ in his very interesting historical account of the Dickcissel, does not attempt to offer a final solution of this remarkable and puzzling change in the limits of the Dickcissel's distribution, but he offers some interesting suggestions on the subject. Some ornithologists are inclined to doubt whether the Dickcissel was as abundant in the eastern United States as the writings of the older authors would lead us to believe.

The winter range of the Dickcissel extends as far south as northern South America (Colombia and Trinidad Island). Its migration is made through Mexico and Central America but there are occasional records of migration by way of Swan Island in the Caribbean Sea, and even as far east as Jamaica.

III. ABUNDANCE AND DISTRIBUTION OF THE DICKCISSEL IN ILLINOIS.

In marked contrast to its status in the eastern section of its former range, this bird is, as I have said, apparently becoming more abundant in the middle west. In comparing the older with

²⁴ Miller, W. DeW. 1904, Auk, vol. 21, p. 487.

²⁷ Chapman, F. 1891, Auk, vol. 8, p. 395.

²⁸ Dutcher, W. 1893, Auk, vol. 10, p. 276; and 1889, Auk, vol. 6, p. 137.

²⁹ Dwight, J., Jr. 1897, Auk, vol. 14, p. 95.

³⁰ Johnson, F. E. 1891, Auk, vol. 8, p. 116.

³¹ Robinson, W. 1889, Auk, vol. 6, p. 194.

³² Purdie, H. A. 1878, Bull. Nutt. Orn. Club, vol. 3, p. 45.

³⁶ Brewer, T. M. 1878, Bull. Nutt. Orn. Club, vol. 3, p. 190.

³⁴ Deane, R. 1879, Bull. Nutt. Orn. Club, vol. 4, pp. 122-123.

³⁵ Beckham, C. W. 1882, Bull. Nutt. Orn. Club, vol. 7, p. 250.

³⁷ Scott, W. E. D. 1889, Auk, vol. 6, pp. 318-326.

³⁸ Knight, Ora W. 1897, Bull. Univ. Maine, no. 3, p. 103.

³⁹ Townsend, C. W. 1885, Auk, vol. 2, p. 106.

⁴⁰ Norton, A. H. 1893, Auk, vol. 10, p. 302; and 1894, vol. 11, pp. 78-79.

⁴¹ White, F. B. 1919, Auk, vol. 36, p. 288.

⁴² Dwight, J., Jr. 1903, Auk, vol. 20, p. 440.

the more recent records of abundance, this increase is especially noticeable in the northern section of Illinois, as well as along the northern limits of its present range. Unfortunately, there is a personal factor to be reckoned with in considering the records of general abundance by different authors, so that comparisons thus made are often misleading. Furthermore, students of birds may report a bird as common or abundant when their information is based on general impressions received from a study of one or of a limited number of localities. It may be that little or no thought is given to the abundance or density of the species as compared with all the species of birds which occur in the entire region considered. To say that the Dickcissel is common means one thing to one observer and something else to another. There is urgent need for more specific information on this important matter in relation to all our birds. It is to Prof. S. A. Forbes, of the Illinois State Laboratory of Natural History, that we are indebted for planning and carrying out the statistical ornithological survey of Illinois, the first survey of its kind ever made for any extensive area. The details of the methods employed by Professor Forbes, as well as some of the more general results obtained, may be learned by referring to his two preliminary reports: 'An Ornithological Cross-section of Illinois in Autumn,'⁴⁵ and 'The Mid-summer Bird Life of Illinois: A Statistical Study.'⁴⁶

For purposes of this paper only the work accomplished by the survey during the summer months, when the Dickcissel was present, will be considered. For convenience, the state was divided into three sections: northern, central, and southern. In each section a locality, comprising several counties, typical for that part of the state, was selected and trips were made on foot in various directions. Accompanied by an assistant the author of this paper, who had charge of the field work, traveled through the fields and noted as he went the species and number of birds flushed on a strip fifty yards in width, including those flying across the strip within one hundred yards to the front. A record was also kept, by means of pedometers and mechanical counters, of the distances traveled over each area. When all the records

⁴⁵ Forbes, S. A., 1907, Bull. Ill. State Lab. Nat. Hist., VII, pp. 305-335.

⁴⁶ Forbes, S. A., 1908, Amer. Nat. 42, pp. 505-519.

were accumulated and tabulated it was a simple matter to ascertain the relative abundance and density of each species for each kind of crop and area and for the state as a whole. While the data are not yet sufficient in amount to yield absolute results in all cases, they do provide by far the most reliable statistics in existence concerning the abundance of the common birds of the Illinois fields.

In 1907, a month was spent in each of the three sections of the state: June in southern, July in central, and August in northern Illinois. For many birds the observations were made at a time when their population was comparatively stable and not greatly affected by migratory movements. By beginning in the south and ending in the north the differences, due to changing conditions, were reduced but not entirely eliminated. In 1909 the work was repeated with an effort to avoid the disturbing factor of seasonal variation by spending only about ten days at a time, instead of a month, in each section. Thus every section was visited each month and therefore in its turn three times during the summer.

The following tables, I and II, containing the general statistics for the summers of 1907 and 1909, respectively, are intended to serve as a means of comparing the work of the survey of the two summers, and especially that relating to the Dickcissel.

TABLE I.
GENERAL STATISTICS ILLINOIS BIRD SURVEY—SUMMER, 1907.

Section	Time	Acres on which birds were counted	No. of birds counted on 50-yd. strip	No. of species	No. of Dickcissels counted on 50-yd. strip	No. of Dickcissels per square mile	Order of Dickcissel abundance
Northern Illinois	July 29– Aug. 23	3172	3026	66	53	10.69	16th
Central Illinois	July 9– July 24	2117	2047	49	136	41.12	5th
Southern Illinois	June 4– July 1	2504	2667	70	204	52.14	4th
Totals		7793	7740	85	393	32.2	5th

TABLE II.
GENERAL STATISTICS ILLINOIS BIRD SURVEY—SUMMER, 1909.

Section	Time	Acres on which birds were counted	No. of birds counted on 50-yd. strip	No. of species	No. of Dickcissels counted on 50-yd. strip	No. of Dickcissels per square mile	Order of Dickcissel abundance
Northern Illinois	June 30– Sept. 15	4794	7647	71	96	12.83	5th
Central Illinois	June 22– Sept. 4	3807	6368	67	147	24.72	5th
Southern Illinois	June 8– Aug. 26	3023	3973	81	110	23.28	7th
Totals		11624	17988	117	353	18.9	11th

The statistics of the above tables give us concrete evidence of the great abundance of the Dickcissel and emphasize the importance of the species in the economic ornithology of the middle west. In 1909, out of 85 species recorded for the whole state, the Dickcissel ranked fifth in the abundance of individual birds, and in 1909, among the 177 species observed, it stands eleventh. According to these data there are, during the summer months in the 56,000 square miles of the state, more than a million Dickcissels busily engaged in protecting valuable crops from the devastating grasshoppers. Surely such an army of useful workers is not to be ignored in these strenuous times of conservation.

The density of the Dickcissel population of southern Illinois is practically the same as it is in the central part of the state; whereas in the northern third of the state the number of Dickcissels per square mile is very much less. This marked difference is correlated with the fact that northern Illinois, about 42° lat., is near the northern limit of the summer range of this bird.

The following table, No. III, gives one an insight into the distribution of the Dickcissel on the various crops. The table includes those areas on which twelve or more of the birds were

counted, arranged in order, beginning at the left with the one which contained the largest number of Dickcissels per square mile.

TABLE III.

CROPS AND AREAS OF ILLINOIS ON WHICH AT LEAST 12 BIRDS WERE SEEN
WITHIN THE 50-YARD STRIP—SUMMER, 1909.

Crops	Meadow	Waste and Fallow	Oats	Wheat and Rye	Pasture	Corn
Acres.....	1501.35	423.96	1166.02	385.81	2265.57	3941.51
Miles (linear)....	82.85	23.37	64.14	21.22	124.69	216.81
Square miles.....	2.339	.668	1.822	.609	3.530	6.151
All birds seen with- in 50-yd. strip...	2113	464	1022	452	4228	4789
Dickcissels.....	190	23	39	12	44	32
Percentage of Dick cissels among all birds seen.....	8.94	4.95	3.81	2.65	1.04	.066
Dickcissels per sq. mile.....	81.2	34.4	21.4	19.7	12.4	5.2

The above table shows the Dickcissel to be preeminently a bird of the meadows, where, for the state as a whole, its concentration is 81.2 birds to the square mile. It is attracted to the meadows not only by the many grasshoppers and other insects found there, which supply much of its sustenance, but also by the dense low vegetation, which provides nesting sites well adapted for the type of nest built by the Dickcissel. Those meadows which have the densest growth, such as clover and alfalfa, are preferred to those of timothy or other grass.

The pastures, though presenting conditions similar to those of meadows, were found to contain a Dickcissel population of only about twelve to the square mile. This much smaller number in pastures is to be explained not by the difference in the character of the vegetation but by the continual disturbance which the nesting birds receive from the grazing stock.

The waste and fallow ground areas, which rank next to the meadows in numbers of Dickcissels per square mile, have a vege-

tation favorable for attracting these birds and are situations least disturbed, for here not even the plow and the devastating mower or binder ever bring the home life of the birds to a sudden and disastrous ending.

In the grain fields the Dickcissel is present in numbers intermediate between those of the meadows and pastures. The number found per square mile on oats is practically the same as that on the wheat and rye fields.

Of all the areas listed in the table, the cornfields, as one might anticipate, contain the lowest density of Dickcissel life, because they provide neither food nor favorable nesting sites to lure the Dickcissels from other fields. Furthermore, the period of cultivating the soil coincides with the early part of the nesting season of the Dickcissel so that any nests built in cornfields would certainly be destroyed. The small number of these birds found in cornfields, only five to the square mile, were there accidentally. It was not uncommon to find that the cornstalks bordering meadows were used as the favorite alighting places for the singing males, as well as vantage points for the female in approaching her concealed nest. All birds thus seen within the fifty-yard strip were of course included in the count for the cornfields. A most significant fact is that only 6/100 of one per cent. of all the birds seen in the cornfields were Dickcissels; whereas, in meadows they comprised almost nine per cent. of the total bird population.

Other areas in which the Dickcissel was recorded, but in numbers too small to be included in Table III, are as follows: Swamp 3; Shrubbery 3; Gardens 3; Timber 3; and Orchards 1.

No Dickcissels were observed in house or barn yards, in plowed ground or stubble fields.

The following Table IV is a list of the twelve most abundant birds, observed during the summer survey of 1909, arranged in order beginning with the one represented by the largest number of individuals. It will aid the reader in realizing the numerical position of the Dickcissel among the abundant birds of Illinois. These twelve birds, of which the Dickcissel is the eleventh, comprise more than 76 per cent. of the total bird population of the state and hence are the species which deserve most attention when considering the economic ornithology of the middle west

states. The figures were obtained in the same manner described in connection with the earlier tables.

TABLE IV.

THE TWELVE COMMONEST BIRDS WITH THE NUMBERS OF EACH SPECIES SEEN WITHIN THE FIFTY-YARD STRIP ON ALL AREAS INCLUDED IN THE SURVEY OF THE STATE—SUMMER, 1909.

Order of abundance	Common name	Total no. seen
1	English Sparrow	4239
2	Bronzed Grackle	2455
3	Cowbird	1845
4	Meadowlark	1434
5	Mourning Dove	670
6	Bobolink	631
7	Red-winged Blackbird	573
8	Flicker	419
9	Robin	417
10	Prairie Horned Lark	414
11	Dickcissel	353
12	Crow	287
Total		13737

Two characteristic habitats of the Dickcissel are shown in Plate II. The clover field photographed July 16, 1907, near Lincoln, Logan County, Illinois, one of the last in the vicinity to be harvested, was virtually alive with birds. The author located seven nests of the Dickcissel containing eggs or young in this field and there were many young birds in juvenal plumage seen perched on the Canada thistles and other weeds. In addition to the Dickcissel nests there were two nests of the Grasshopper Sparrow, one of the Vesper Sparrow, two of the Meadowlark, and one of the Upland Plover. Other birds found in the same ecological association were the Bob-white, Prairie Hen, Mourning Dove, Flicker, Prairie Horned Lark, Cowbird, Bronzed Grackle, Goldfinch, and English Sparrow.

The timothy field was photographed June 4, 1907, near Benton, Franklin County, in southern Illinois. Such fields, though

not as often selected as clover fields for a nesting site, harbor a large number of Dickcissel homes. In this field the author found two Dickcissel nests, one Meadowlark nest and a Quail nest containing sixteen eggs. The nests of the Dickcissel were concealed and protected by dew-berry vines in addition to the rank growth of grass. In the woods and shrubbery seen in the background of this view were Mourning Doves, Yellow-billed Cuckoos, Phoebe, Field Sparrows, Bachman's Sparrows, Scarlet Tanagers, Mockingbirds, Brown Thrashers and Carolina Wrens.

IV. MIGRATION.

The first male Dickcissels make their appearance in central Illinois about the last week of April or the first week of May. The females usually come about a week later, but the bulk of individuals are seldom seen until after the middle of May.

The following "first seen" records were made at Urbana, in east central Illinois by Prof. Frank Smith and others, during the past eighteen years. Field trips were made practically each day during the spring migrations, so that these records represent an accurate series of dates of the first appearances of the male birds. The average date of these eighteen years is May 3.

1901.....	May 7	1911.....	April 29
1902.....	May 2	1912.....	May 2
1903.....	May 16	1913.....	May 4
1904.....	May 5	1914.....	April 28
1905.....	May 11	1915.....	April 28
1906.....	May 5	1916.....	May 5
1907.....	May 5	1917.....	April 24
1908.....	April 25	1918.....	May 2
1909.....	April 29		
1910.....	May 10		

The following records from Quincy on the Mississippi River, the extreme western side of the State, were made by Mr. T. E. Musselman:

1910.....	April 30	1916.....	April 30
1911.....	April 21	1917.....	May 6
1912.....	April 25	1918.....	May 5
1913.....	April 28		

The average of the above dates of the first arrivals at Quincy is April 29—four days earlier than the average of those made at Urbana. If it is true that the vanguard of the birds which constitute the migration waves follow the large river courses, then the earlier dates at Quincy may be correlated with the fact that the city is situated on the Mississippi River, the main immigration route of the middle west.

Records of the spring migration of the Dickcissel made by Prof. Gates at Carthage College, Carthage, Illinois, show an average date of several days later than those at Quincy, Illinois. Although only forty miles north of Quincy, this place is near the headwaters of a stream tributary to the Illinois, therefore migration requires a longer time.

The fall migration of the Dickcissel has been given but scant attention by observers in central Illinois. The silent departure of these birds in autumn is nevertheless quite as interesting as their more heralded coming in the springtime. In August, at the close of the nesting season, the Dickcissels rove about for a short time as family groups, these soon unite with others, which in turn may join still larger aggregations to form roosts of several hundred individuals. In 1908 a roost which contained considerably more than 300 birds on August 20 had very few representatives on September 1, and by September 10 all had left, presumably for the southland. A roost under observation during the summer of 1918 was located along the banks of a large drainage ditch, the sides of which, for a distance of nearly a mile, were covered with giant rag-weeds and horse-weeds eight to ten feet in height. Although it is excessively hot and dry at this season of the year, the ditch contained cool refreshing water. This attractive feature, together with the admirable concealment and roost provided by the tall weeds, made an ideal concentration center for many Dickcissels. A few could be seen feeding on the seeds of the weeds or bathing in the water at almost every hour of the day, but the mass of individuals came in at twilight between sunset and dark. On August 5 there were only about fifty birds, on August 8 about 125, but August 10, 485 Dickcissels, adults and young, were counted and doubtless more than twice that number of birds were concealed by the dense growth of weeds

and thus escaped being seen. By August 15 there was a very perceptible diminution in the numbers at the roost and there is every reason to believe the fall migration had then begun. I was obliged to leave Illinois at this time, so records of the latest appearances at this roost were not made.

Most of the Dickcissels are gone from central Illinois by September 10 to 15, but some stragglers may linger several days longer. The latest record that I have is of a young male bird collected October 2, 1907.

V. DESCRIPTIONS AND MEASUREMENTS OF ADULT BIRDS.

The specimens of Dickcissels, upon which the following descriptions and measurements are based, were collected near Atwood, Illinois, during the summer of 1918. The colors were determined with the use of Ridgway's 'Color Standards and Nomenclature.' The numbers and letters following the names of the colors refer to the hue and tone respectively. The colors here given are at best approximations.

Nuptial plumage (adult male).—The top of the head, back and sides of the neck, lores and auriculars pale neutral gray (69''''d); crown and forehead tinged with olive-ocher (21''a), an amber yellow (21'b) line over the eye which becomes white posteriorly; back mouse gray (15''''a) tinged with cinnamon-drab (13''''a) and streaked with black; rump and tail coverts smoke gray (21''''d)* without streaks; lesser and middle wing coverts, cinnamon-rufous (11'i); edge of wing, empire yellow (21'b); secondaries, primaries and rectrices, fuscous (13''''k) and narrowly edged with pale mouse gray (15''''d); malar stripe, amber yellow (21'b) anteriorly, broadening posteriorly into a white area on either side of a black throat patch; chin white; breast wax yellow fading to pure white on the belly and under tail coverts; mandibles dusky slate-blue (40''m); the legs and feet Prout's brown (15'm); iris dark brown. (In male specimens in the nuptial plumage collected June-July there is a small black patch of variable size near the middle of the yellow breast and in all except one this spot is completely separated from the black area of the throat.)

* Cf. Color numbers in Ridgway's 'Nomenclature.'

Nuptial plumage (adult female).—The upper parts of the female are similar to those of the male, but the gray is represented by shades of brown; crown with fine black streaks and with very little yellow; the general coloration very much duller, especially the rufous of the wings and the yellow of the breast, which are much reduced in amount as compared with the male; in three specimens the rufous of the wings is practically absent, being instead gray and fuscous, the coverts being fuscous with only a few of the feathers margined with cinnamon-rufous (11'i); chin and throat white; pronounced black lateral chin stripes bordering the maize yellow (19f) malar stripes; (in six females the black throat patch, so conspicuous in the male, is entirely lacking but in one adult female taken August 2 there is a reduced patch of chaetura black (17'''m) on the throat which connects on either side with the lateral throat stripes); in all specimens, the straw yellow (21'd) breast finely streaked with dark brown; flanks white, washed with avellaneous (17'''b) and finely streaked with fuscous or brown; the primaries, secondaries, tail, bill and legs similar to the male. (The females collected during the late summer toward the close of the nesting season have a plumage that is very soiled and worn; the barbs of the outer tail feathers of some of the females collected in August were completely worn off, leaving nothing but the naked shafts. The plumage of the male is only slightly worn because his part in the rearing of the brood is small, as we will see in the next chapter.)

Adult winter plumage (male).—(This description is based on four specimens collected in Illinois during the first week of August, 1918, three specimens collected during the last week of August, 1908, at Matamoros, Mexico, and another collected at Bolson, Costa Rica, December 13, 1909. Two of the birds collected in Illinois are in a transitional state of the post-nuptial moult, but the others have acquired the complete winter plumage.) This plumage is similar to the nuptial plumage but the entire coloration is very much brighter and the bands and patches of colors more sharply differentiated. The gray of the pileum and neck of the nuptial plumage is replaced by a rich dark olive-brown (17'''k); back snuff brown (15''k) streaked with black; the rufous of the lesser and middle wing coverts a deep chestnut (9m) color; greater

wing coverts broadly edged with mikado brown (13''i) instead of gray as in the nuptial plumage; white edgings of the primaries very prominent; the yellow of the breast is more extensive anteriorly and posteriorly, even the middle of the belly being tinged with yellow; the yellow of the breast approaches cadmium yellow (17a); chin tinged with cream color (19'f); supercilliary and malar stripes light cadmium (19a); the posterior part of the supercilliary stripe light yellow and not white as in the nuptial plumage; the black throat patch reduced in size and is more or less obscured by pale cream tips of the feathers; no traces of black on the lower breast; auriculars and flanks plain olive-brown (17'''m); crissum or under tail coverts warm buff (17'd) instead of white as found in the nuptial plumage.

Adult winter plumage (female).—No females in the adult winter plumage were secured. Though all the males seen and collected had acquired the winter plumage by the time I left Illinois, which was August 15, the females were still in their nuptial plumage and only one of the specimens collected showed the beginnings of the post-nuptial moult. According to Dwight,^a in the female in plumages following the first nuptial, "the throat remains pale brown with lateral chin streaks without the black patch of the male and the colors elsewhere are regularly duller."

A description of the natal, juvenal and first winter plumages will be found under the account of the life history.

The following tables contain the measurements of the specimens upon which the preceding descriptions were based. These skins are now in the collection of the Lee Museum of Biology at Bowdoin College:

TABLE V.

MEASUREMENT OF MALES (CENTIMETERS) NUPTIAL PLUMAGE.					
Specimen number.....	35	39	40	72	85
Date, 1918.....	June 7	June 10	June 10	Aug. 2	Aug. 6
Bill.....	1.5	1.45	1.5	1.5	1.7
Wing.....	8.8	8.5	8.5	8.3	8.3
Length.....	18.1	16.8	17.9	17.8	18.0
Tail.....	6.7	6.4	6.2	6.3	6.1
Extent.....	....	....	....	27.0	27.1

^a 1899, Ann. N. Y. Acad. Sci., 13, pp. 216-218.

Tarsus with middle toe..	4.7	4.3	4.6	4.8	4.9
Tip to tip of toes.....	3.8	3.7	3.6	3.9	4.0
3rd or front middle toe nail.....	.64	.65	.68	.6	.69
1st or hind toe nail.....	.86	.78	.80	.72	.85
6th primary.....	5.8	5.3	5.2	5.5	5.7
3rd secondary.....	5.2	4.9	4.8	5.0	5.1
Weight, grams.....	....	....	....	30.7	32.9

TABLE VI.

MEASUREMENTS OF FEMALES (CENTIMETERS) NUPTIAL PLUMAGE.

Specimen number.	51	65	66	69	70	83	84
Date, 1918.....	July 17	July 31	July 31	Aug. 1	Aug. 2	Aug. 6	Aug. 6
Bill.....	1.4	1.4	1.5	1.5	1.5	1.4	1.5
Wing.....	7.6	7.8	7.6	7.3	7.5	7.3	7.2
Length.....	15.9	16.0	15.1	15.7	15.6	16.4	16.5
Tail.....	5.3	5.2	5.3	5.3	5.3	5.5	5.0
Extent.....	24.3	25.2	23.5	24.1	24.5	24.1	23.8
Tarsus with mid- dle toe.....	4.6	4.7	4.5	4.4	4.6	4.6	4.6
Tip to tip of toes..	3.8	3.9	3.6	3.9	3.8	3.5	3.8
3rd or front middle toe nail.....	.71	.70	.60	.68	.62	.70	.68
1st or hind toe nail	.81	.85	.80	.80	.78	.80	.81
6th primary.....	5.2	5.4	5.1	4.9	4.8	5.0	4.8
3rd secondary....	4.7	5.0	4.4	4.5	4.5	4.5	4.4
Weight, grams....	28.6	27.1	26.5	27.3	23.4	30.6	23.4

TABLE VII.

MEASUREMENTS OF MALES (CENTIMETERS).

79 and 105 adult winter plumage.

73 and 86 Intermediate between nuptial and adult winter plumages
in post nuptial moult.

Specimen number.....	73	79	86	105
Date, 1918.....	Aug. 2	Aug. 6	Aug. 6	Aug. 9
Bill.....	1.6	1.5	1.6	1.5
Wing.....	8.2	8.0	8.0	8.1
Length.....	15.6	17.4	14.6	17.9
Tail.....	3.8	6.2	3.4	6.3
Extent.....	26.8	26.5	26.8	26.6
Tarsus.....	5.0	4.8	5.2	4.9
Tip to tip of toes.....	4.2	3.8	4.3	4.0

3rd or front middle toe nail.....	.68	.65	.70	.64
1st or hind toe nail.....	.80	.82	.90	.85
6th primary.....	4.4	5.5	4.9	5.6
3rd secondary.....	5.1	4.5	4.8	5.0
Weight, grams.....	32.8	36.7	32.3	35.8

VI. GENERAL ACTIVITIES AND BEHAVIOR.

The following notes on the behavior of the Dickcissel were made during the nesting season, a time when there was an opportunity to study the birds from blinds at close range. Certain features of behavior which might properly belong here are discussed under other topics of this paper.

The study of the home life of a pair of birds that built their nest in the tall weeds and grass along a country roadside, supplied many interesting incidents which help in portraying the character and behavior of the Dickcissel. This nest (Plate V, fig. 9) built about ten inches above the ground, was composed of materials loosely interwoven among the stems of the tall weeds and grass. The tops of the grass and weeds which arched over this little home, protected the eggs and young from the direct rays of the sun and concealed them from the view of all who might pass. The wires of a barbed-wire fence which ran through the thicket of weeds also aided in protecting the nest from stray animals or even from people who might trample on the fragile structure. The fence, as well as the telephone poles and wires, provided excellent sentinel posts for the male and desirable perches for the cautious female when she went to and from her nest.

A blind from which observations of the birds could easily be made was constructed in the tall weeds along the fence about twelve feet from the nest. It was completely covered with cut grasses and weeds which gave to the surroundings nothing striking or unusual that might arouse the suspicions of the birds and thus cause them to leave. On the day after the blind was built the home life of the birds was being conducted in an apparently normal way and, so far as could be determined, not the least attention was paid by the birds to the miniature studio erected on their premises. The female flew from the nest when I entered the blind the first time, but after a few minutes she returned to

the telephone wires overhead to utter in unison with her mate the usual chirps of disapproval. The two birds continued chirping for about twenty-five minutes, when the female flew down to the fence wires at a place very near the nest. Something seemed to arouse her suspicions for she returned almost immediately to her mate. She now exhibited a state of uneasiness, for she repeatedly flew back and forth between the telephone wires and the fence. Suddenly, and for no apparent reason except for deception, she flew a long distance across the fields, as if abandoning all desire to return to the nest. The male now ceased chirping and tuned up to his full song. In ten minutes the sagacious female returned to the telephone wire and, without any hesitancy, flew to the fence post nearest her nest. From that point she carefully surveyed all of her surroundings and especially scrutinized the blind where the monster in the shape of a human being had so recently disappeared. Just at this moment the male was singing louder than ever, but his mate did not utter the faintest chirp. When conditions seemed favorable to the female she slipped into the weeds and noiselessly and cautiously made her way to her secret treasures. The birds played their parts well and without doubt their shrewdness misleads many enemies. The performance described above was repeated on following visits to the nest, but after a few days the birds paid little or no attention to my coming or going nor did they seem to be disturbed by the teams and automobiles which passed along the road. Even when the driver sounded his horn directly opposite the nest the birds made no visible response. However, when an automobile or team stopped in the road near the brooding female she invariably scooted off the nest into the grass. If the actions of the people were free from suspicion, she returned to the nest; otherwise, she flew to the telephone wires to chirp until all danger was gone. The female used her usual precaution in returning to her nest while the male seemed to sing with the evident purpose of attracting any attention which might otherwise be directed toward his mate.

At the time of the hatching of the young there is a noticeable change in the behavior of the female, though the male seems unchanged and unmoved by this important event in his household.

The female becomes extremely fidgety and excitable, yet very daring, at the time of these new responsibilities. She exhibits a readiness to hazard many dangers which she would not have faced before her parental instincts had been quickened by the appearance of her young. At this time she will, without the least hesitancy, return to her nestlings while an observer stands in full view only a few yards distant. When the mother bird returned for the first time after the hatching of the young she uttered a series of low subdued notes which seemed like tender greetings. She then carried the egg shells away and dropped them at a place quite remote from the nest. This habit, which is held in common with many other birds, is a part of the good housekeeping of the Dickcissel. All refuse and filth from the young birds is also immediately carried away so that the nest and its surroundings always present a neat and clean appearance. The first food, a larva, was delivered to the young about thirty minutes after the latter had emerged from the egg. The larva was crushed into small pieces which were thrust, at intervals of several seconds, into the gaping mouth of the little wobbly creature. While the little Dickcissel was receiving its first dinner the male bird sat on top of his favorite telephone pole pouring forth a volume of song and seemingly oblivious to what was happening in the weeds and grass below him.

On the following day two more eggs were hatched, but the fourth egg was sterile and remained in the nest unbroken until after the fledgelings left, nine days later.

During the first three days the mother brooded her young very closely and left the nest only when it was necessary to obtain food. Even during the heat of the day when the mercury rose above 90° she clung closely to her nest. When the heat became excessive she panted incessantly and her partially spread wings protruded over the edge of the nest. Though she often presented an appearance of dire desperation, she always remained faithful to her family while the male did nothing but encourage her with his song. On the fourth and fifth days, the mother bird spent less time on the nest and from the sixth to the ninth days, when her ability became sorely taxed to satisfy the ever-increasing appetites of her young, she seldom lingered at the nest for any

length of time. Evidently it was unnecessary for the female to brood the young after the sixth and seventh days because the feathers and the contact of the young birds' bodies with one another easily retained the high body temperature without the aid of the parent. The temperature of nestlings six days old which had been left alone in the nest for an hour was 106° F. (normal for birds), while the surrounding temperature was only 80° F.

The Dickcissel attends strictly to his own affairs, seldom if ever meddling with the life of other birds. When strangers intrude on his premises he not only leaves them alone but often exhibits a marked timidity or cowardice. One day a young Kingbird alighted on the fence wire just above the Dickcissel's nest. It was followed by the parent Kingbird which continued to feed the fledgeling in that place for more than twenty minutes. During this time both of the Dickcissels were exceedingly disturbed but neither dared to offer any objection to the unbidden tyrant.

Many birds, such as Mourning Doves, Bobwhites, Vesper Sparrows, Migrant Shrikes and others, made their appearance about the nest, but at only one time did I see the Dickcissel muster enough courage to assert his feelings about the intrusion. One afternoon a young Dickcissel about three or four weeks old perched on the fence near the nest. As soon as the male saw the strange young bird he stopped his singing abruptly, ruffled his feathers and dashed at the innocent intruder with the ferociousness of a tiger. The scared stranger flew for his life and escaped in the tall weeds and grass. This incident seems to signify that the Dickcissel is ready to assert his authority over the younger of his own kind but is too much of a coward to tackle a bird as large or larger than himself.

When one thinks of the Dickcissel it is usually of a finely colored male perched on a high post or weed stalk pouring forth a volume of earnest and cheerful song. Because of these superficial qualities the male Dickcissel has become a favorite of many bird lovers, but as one becomes more intimately acquainted with the domestic life of the species the less one is apt to admire the male. He takes no part in nest building nor incubation; neither does he

help his mate during the busy time of feeding and caring for the young. The following narrative further justifies us in condemning him as a lazy husband and as a father utterly lacking resourcefulness when responsibilities are thrust upon him. The home where this tragedy was enacted was nestled among the fragrant clover blossoms where, throughout the sunny hours of the day, myriads of beautiful butterflies flitted about from flower to flower sipping the nectar from the clover cups. Loudly above the buzzing of the bumble bees one could hear at regular intervals the notes of the Dickcissel announcing, as well as words could tell, that his family was at home in the clover field. As I watched the male bird the female appeared beside him with a grasshopper nymph for her little ones. The male kept up his singing while his mate flitted nervously from place to place uttering a number of inquiring chirps. After deciding all was well she became quiet and then flew directly to her treasures which were hidden by a beautiful canopy of clover blossoms. A hurried visit to the spot revealed a nest and three birds about four days old, all in excellent condition (plate IV, fig. 7). I again visited this field of clover on the following morning to watch and enjoy the home life of this pair of birds. Their general activities were very much as they were on the preceding day; the female busily plied to and from the nest in a strenuous effort to satisfy three hungry mouths, while the male offered her no help and seemed to think he was "doing his bit" by singing for his family. All was going well in the life of this Dickcissel home when a calamity brought it to a sudden and disastrous ending. The faithful mother was in the act of carrying another tempting morsel to her young when she was taken unawares and carried away in the talons of a Sharp-shinned Hawk. Not more than a minute after this catastrophe, almost before one could come to the realization of what had happened, there came the familiar notes of the male from a post nearby. As I listened to him the thought came to me that he was now confronted by circumstances in which his part must necessarily be more than singing. It seemed to me fortunate for the three young that at least the male had been spared to continue the work so well begun. Throughout the morning the male kept up his singing and he was still at his post in the after-

noon. Early the next morning he was singing as loudly as ever but he made no effort to feed the now starving young. At noon I fed the pitiful creatures some grasshopper nymphs with the hope that the male bird would finally care for them, but on the following day, though the male was still singing, he was singing to ears that could no longer hear the notes that were meant for them.

VII. SONG.

The song of the Dickcissel is simple yet, like many bird notes, it is difficult to put it into words that will convey to the reader the author's interpretation. The song has been written in as many ways as there have been writers to attempt the description, so it seems needless to contribute another to the already long list of versions.

Wilson describes the song as consisting "only of five notes, or rather two: the first being repeated twice and slowly, the second thrice and rapidly, resembling 'tship tship tshe tshe tshe.'" Nuttall states: "With us the call is 'tie tie—tshe tshe tshe tship'" and 'tship tship, tshe tshe tshe tshe tship.'" Dr. Elliott Coues interprets it as "Look! Look! see me here! see!" and again he writes, "the simple ditty sounds like chip-chip-chee, chee, chee." To the Rev. J. Hibbert Langville it sounds like "chic-chic-chèlac-chick-chick-chick" or "chick-ticktshe-chick-chick-chick." Amos W. Butler writes: "It comes to me characteristically as fine metallic sounds something like the noise made by dropping six silver dollars one upon the other into one's hand: clenk, clenk, clenk-clenk-clenk." Mr. Robert Ridgway writes: "They perch upon the summits of tall weed-stalks or fence stakes, at short intervals crying out: See, see, -Dick, Dick-cissel, cissel." This latter is a much quoted interpretation of the song and one which has given popularity to the common name, Dickcissel.

It is possible to imagine the Dickcissel singing almost any of the varied sets of words given above, yet to the reader who has never heard the song, some of these interpretations might be very misleading. If a person unfamiliar with the Dickcissel attempts to imitate some of them, they become ludicrous. If I were to select from the above list of descriptions the ones which

seem to best depict the character of the Dickcissel's song it would be a combination of the ones written by Nuttall and Ridgway, "See See,—Dick!, Dick!, tshe tshe tshe tship (or chisl)." A "tship!, tship!" can be substituted for "Dick!, Dick!," but the latter seems more appropriate when we consider its name. The "see see," which serves as a prelude, is very faint and not heard unless one is near the singer. These preliminary notes are often omitted and I have failed to hear some males utter them at all. The "Dick! Dick!" or "tship! tship!" is loud, strongly accented and repeated slowly. This note is usually uttered twice, but sometimes it may be sounded a third time. It is followed by a rapid succession of three or four notes which sound like "tshe" or "chee." The last note ends abruptly and is slightly different from the others, being more like "tship," and sometimes it resembles "chisl" or merely "isl." When the bird is weary, and often when the weather is excessively hot, the song is simplified to "Dick! Dick!-isl" and sometimes at irregular intervals it is merely "Dick! Dick!"

The Dickcissel begins singing as soon as it arrives in the spring, indeed, the presence of the male newcomer is usually made known by his loud characteristic call. During the nesting season the song can be heard at nearly all times of the day, but it is by no means the first of the bird voices to be heard in the morning. During the early morning hours, while waiting in my blind for the coming of dawn, the weird call of the Pheasants, the booming of the Prairie Hens, the cooing of the Mourning Doves, the whistled Bob-white calls and even the sweet notes of the Song and Vesper Sparrows were heard long before the Dickcissel added his voice to the chorus. As the day wore on and the heat increased the first voices were silenced one by one, but the Dickcissel kept up his singing with an undiminished earnestness. Even in the middle of the day, when the waves of heat that rose from the fields to an almost unbearable intensity drove most birds to cover, the song of the Dickcissel was still in evidence. The earnestness and persistence of the Dickcissel is a trait we are compelled to admire.

The songs of the Dickcissel follow in such rapid succession and in such regularity that a record of the number of calls per

minute during different times of the day are interesting. For this purpose a male was selected whose mate was brooding a nest of young a few yards from one of my blinds. The favorite perch of this bird was the top of a gnarled stump, the highest point in the neighborhood of the nest. The times of the day selected for the count were five o'clock and ten o'clock in the morning and a third count at noon. Counts of the number of songs per minute of other males made at various times on other days were similar so that the records presented represent a fair average condition.

TABLE VIII.

COUNTS OF THE NUMBER OF DICKCISSEL SONGS PER MINUTE.

(Time—5:05–5:21 A. M.)

1st minute, 12 calls	7th minute, 0 calls	12th minute, 10 calls
2nd " 5 "	8th " 0 "	13th " 13 "
3rd " 3 "	9th " 6 "	14th " 9 "
4th " 10 "	10th " 7 "	15th " 6 "
5th " 10 "	11th " 9 "	16th " 7 "
6th " 7 "		

In the above counts there are a total of 114 calls for the 16 minutes or an average of 7.1 calls per minute. Before the end of the 6th minute the bird left his perch, captured and ate a grasshopper and resumed his singing during the 9th minute.

TABLE IX.

COUNTS OF THE NUMBER OF DICKCISSEL SONGS PER MINUTE.

(Time—9:55–10:11 A. M.)

1st minute, 10 calls	7th minute, 8 calls	12th minute, 12 calls
2nd " 12 "	8th " 0 "	13th " 12 "
3rd " 9 "	9th " 0 "	14th " 8 "
4th " 9 "	10th " 0 "	15th " 2 "
5th " 9 "	11th " 12 "	16th " 10 "
6th " 10 "		

In the above counts there are a total of 122 calls for the 16 minutes and an average of 7.6 calls per minute.

TABLE X.

COUNTS OF THE NUMBER OF DICKCISSEL SONGS PER MINUTE.

(Time—12:00–12:16.)

1st minute, 10 calls	7th minute, 0 calls	12th minute, 5 calls
2nd " 13 "	8th " 13 "	13th " 7 "
3rd " 14 "	9th " 11 "	14th " 8 "
4th " 7 "	10th " 13 "	15th " 10 "
5th " 4 "	11th " 2 "	16th " 15 "
6th " 0 "		

In the last series of counts there is a total of 132 calls for the 16 minutes and an average of 8.2 calls per minute. It is in the last minute of the last trial that the Dickcissel reached the maximum number of 15 calls per minute, the highest count made during the summer. During that minute the song was uttered on an average of once every four seconds.

From a comparison of these counts, which are typical among many others, it is seen that the rate of the repetition does not diminish but actually increases in this case from 7.1, at five o'clock to more than eight calls per minute, during the intense heat of the midday sun. When the heat was excessive (above 100° F.) the quality of the song was greatly interfered with by the rapid respiration or panting of the bird; at such times the song was often a repetition of "tship, tship" without the prelude or the usual ending.

The Dickcissel is active for twelve to fourteen hours during the day, hence it will be seen that if the male maintains an average of seven repetitions per minute he will repeat his song about 400 times an hour or more than 5000 times during the day. Is it any great wonder that the song of the Dickcissel is described as monotonous and wearisome? I know of no bird which sings more frequently and continuously, neither the Red-eyed Vireo nor the Ovenbird is a match for him.

The average number of chirps, uttered by the female when disturbed, taken over similar periods of time as those shown above for the male, varied from ten to fifty per minute depending on the state of her excitement.

Though the Dickcissel is not the first to begin the morning bird song he is one of the latest singers at night. Even after

the glow of sunset is gone I have heard the voice of the Dickcissel sound above the hoarse calls of the toads and the varied tones of the myriads of singing insects. The only other bird note I heard on those prairie fields after the last Dickcissels had settled for the night was the shriek of a Screech Owl awakening from his day nap in the tall hedge across the field.

During the first or second week of August the clover fields and meadows, which during June and July resounded with the calls of the Dickcissel, became quiet. By the middle of August you may find a number of females still busy feeding and caring for their young, but the males have deserted their haunts to join others now at the secluded roosts. Here they change their nuptial suit for a new and brighter plumage before beginning their annual fall migration. Though these birds remain in the north several weeks longer, the male song is now silenced for another year, and to the casual observer the Dickcissels seem to have left their prairie homes for the southland.

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(To be continued.)

A NESTING OF THE PHILADELPHIA VIREO.

BY HARRISON F. LEWIS.

INTRODUCTION.

IN June and July, 1919, a nesting of the Philadelphia Vireo (*Vireosylva philadelphia* Cass.) took place on the grounds of my residence at a distance of about thirty feet from my front door. By reason of this fortunate proximity I was able to make daily observations of the home life of this species, the results of which are here presented.

It should be stated that, prior to the occurrence of this nesting, I had not, to my knowledge, observed a Philadelphia Vireo in life, and that I possess no distinct recollection of mounted specimens which I may have seen. Nevertheless, as these adult nesting birds were repeatedly observed by me, with the aid of opera-

glasses, at distances of three to six feet, under a great variety of conditions with regard to position and light, I am positive of the identification in their case, and have no hesitation whatever in submitting it to the judgment of others. The living birds were compared in detail with descriptions of the species as given by Coues¹ and Chapman,² and the various characteristic particulars of coloration and of comparative size were noted. Comparison was also made with the colored plate of an individual which appears with a paper by Dwight,³ which demonstrated a general agreement, although the yellow of the underparts was not as rich in the birds seen by me as in the plate. However, not only does the strength of this yellow wash appear very different in different lights, but, as will be shown later, there seems to be considerable individual variation in the richness of it, even in birds of the same brood.

To Mr. C. E. Dionne, of Laval University, Quebec, I am much indebted for his kindness in lending me literature concerning the Philadelphia Vireo and for his aid in the identification of some of the insect food of the birds.

As both sexes are colored alike in this species, and as the female sings to some extent, and as the male aids in incubation and in feeding the young, I was often unable to distinguish between the two birds. In this paper I have not recorded them as male and female unless I was practically certain of the sex at the time.

The time used throughout this paper is Eastern Standard Time, not "summer" or "daylight-saving" time.

LOCALITY.

My present residence, where this nesting occurred, is in the little village of Bergerville, in the Parish of St. Colomb de Sillery, in the immediate suburbs of the city of Quebec. Its elevation above sea-level is about three hundred feet. Southeast of it, at a distance of about half a mile, is the St. Lawrence River, which is here a tidal stream. No other stream or body of water of

¹ Key to North American Birds, 5th ed., 1903.

² Handbook of Birds of Eastern N. A., Rev. ed., 1912.

³ The Auk, XIV, 1897, pp. 259-272.

appreciable size exists within a radius of half a mile of the nesting-place.

The underlying rocks at this point belong to the Silurian formation of the Cambrian system.

The country immediately about the nesting-site is the gently undulating surface of the ridge at the end of which Quebec is built. My residence and the nesting-tree are on an elevation rising slightly and gradually above the general level of the vicinity. The quadrant lying west of the nesting-site, between southwest and northwest, is mainly occupied by rather open woods of Red Oak (*Quercus rubra* L.), and White Birches (*Betula pendula* Roth. and *B. alba* L.), mixed with a few trees of White Pine (*Pinus Strobus* L.), Balsam Fir (*Abies balsamea* (L.) Mill.), and Red Maple (*Acer rubrum* L.). This woodland area, which is two or three square miles in extent, approaches to within about thirty feet of the nesting-tree. The three other quadrants about the nesting-site contain fields and scattered dwellings, the latter surrounded by numerous shade trees, mostly Red Oak, White Pine, and Rock Maple (*Acer saccharum* Marsh.). No public highway passes very near to the nesting-place.

NESTING.

June 11. While walking to my garden in the afternoon I saw for a moment on the black roof of a shed a Vireo which seemed to be smaller and grayer than a Red-eyed Vireo. It flew away quickly and I was too busy at the time to follow it.

June 12. About 7:00 a. m. I saw a small, grayish Vireo on the roof of the porch of my house. It flew up under the eaves of the main roof, tore away with its bill a spider's white "cocoon" which was placed there, and alighted on the roof of the house with the "cocoon" streaming from its mouth. It then flew away with it to some Rock Maples nearby. Again I was too busy to follow it.

In the early evening, on the grounds of my residence, I saw one Vireo chasing another, and, by "squeaking," succeeded in attracting the attention of the pursuer, which alighted in a Rock Maple about six or seven feet from me. For three or four minutes I studied it through opera-glasses as it moved nervously about.

I was able to observe at this time that it was smaller than a Red-eyed Vireo, that its crown was grayish, without a black border, that there was a pronounced whitish line over the eye, that the wings appeared grayish, with some traces of olive-green, but without wing-bars, and that the throat, breast, and under tail-coverts showed distinctly yellowish, especially the throat and breast. The yellow appeared as a strong "wash," but not as the ground-color, which was white or nearly white. One or two separate notes only were heard. I became convinced that the bird was a Philadelphia Vireo.

June 13. About 6:00 a. m. one Philadelphia Vireo, presumably the female, was seen carrying nesting material repeatedly to a young Rock Maple about thirty feet from my front door. The material, which appeared to be dead grass, was gathered from the ground at a point about eighty feet from the nesting-tree. The other Philadelphia Vireo, supposed to be the male, accompanied his mate back and forth as she brought material to the nest, and, while perched, sang a good deal, rather slowly, in a low, sweet voice. When the pair were together, they uttered low conversational notes, and the male at one time scolded me a little. I observed that the yellow wash was present on his belly, and that his back was grayish.

After failing to discover the nest from the ground by looking into the nesting-tree from every side, I climbed the tree at 5:00 p. m. and found the nest quite high up and well hidden by the foliage. It was placed in the fork of a slender twig which sprang from the main bole of the tree. The top of the tree was so slender that, at the highest point which I could reach, my head was about a foot below the nest, so that I could not look into it. When I had descended I found that from one particular point it could be seen quite clearly from the ground. One of the Vireos was working at it almost as soon as I was away from the tree. At 6:00 p. m. I climbed the tree again and, by feeling in the nest, discovered that there were no eggs in it, and that it seemed to be unlined.

June 14. Beginning at 5:45 a. m., I watched the Philadelphia Vireos for about forty-five minutes. One bird, probably the female, was proceeding with the nest-building. She gathered

dead grass from the ground at a point about ten feet from the nesting-tree and also from other places out of my sight. At one time she went on the nest and remained quiet for several minutes. She seldom flew directly to the nest, preferring to alight once or twice on branches nearby and to reach the nest by a final short flight. The other bird, which was not heard to sing during the morning, stayed much in the lower part of the nesting-tree or in the maples near it. Sometimes he would accompany his mate on her trips for nesting-material, returning just behind her to the vicinity of their home. At other times he would remain not far from the nest, and, when he saw her coming, would fly out to meet her and escort her back to it. I did not see the male take any part in gathering material or in working on the nest, but I would point out again that I was not able to distinguish the sexes with absolute certainty, and that my only reasons for assuming that it was the female which did the work are that this seems the probability, since the females of most species of birds take the lead in such work, and that the bird which was not working sometimes sang. Various call notes were frequently heard during the morning, especially when the birds were together near the nest.

At 4.40 p. m. I climbed to the nest and observed that there were no eggs in it. Examination of its interior was commonly made, on this and subsequent occasions, by looking at the surface of a mirror held above it. No Vireos were seen while I was in the tree at this time. When I reached the ground again, I heard the song of the Philadelphia Vireo nearby. I fixed my gaze steadfastly on the willow from which the song seemed to come, and started to walk slowly toward it, but, when I had covered about half the distance, the song, which had not ceased, seemed suddenly to come from behind me. I turned sharply about and saw the singer, about three feet from my head, on a level with my eyes, perched on the bare branch of a small dead apple tree. It had continued to sing in that exposed position while I walked past, unseeing, within three feet of it. It sang again once or twice, then flew away.

June 15. Cloudy. Before I left the house in the morning, I heard the song of the Philadelphia Vireo between 5.50 and 6.00

o'clock. At 6.30 a. m. I sat down out-of-doors in sight of the nest. One bird was on the nest at the time, but it left silently after a minute or two. At 7.13 one bird went on the nest and sat there quietly until it flew off at 7.18 and met the other bird two or three feet away among dense foliage where I could not see them. The other bird had entered the tree unobserved by me, which it could do easily if it entered on the far side of the tree, as the foliage was very thick. One bird soon flew back to the nest and worked at it, now from this side, now from that, until 7.35, when it flew away quietly. At 7.50 one bird went on the nest. At 8.03 the other bird flew into the tree just below the nest and the bird on the nest left its position and went down two or three feet to meet its mate out of my sight among the leaves. Almost immediately one bird returned to the nest, while the other went to the lower part of the tree and then flew away. The bird at the nest worked at it almost continuously until 8.25, then departed. A slight sprinkle of rain began at 8.34. At 8.36 I observed a bird on the nest, though I did not actually see it go on. Soon afterward I heard the usual singing, which seemed to come from the sitting bird, although I was not sure that it might not be from another bird, concealed in the thick foliage nearby. This song which seemed to come from the sitting bird was heard at intervals during the morning. The bird was still on the nest when the shower ceased at 9.00 a. m. I then went indoors, noting that the temperature was 72° F.

At 11.40 a. m. I resumed my observations and found one bird on the nest. It again seemed that this bird was singing. After a few moments the other bird flew from behind me and entered the nesting-tree below the nest, thus proving that the song had been uttered by the sitting bird. The bird on the nest flew down to meet its mate in the thick foliage, then a moment later one bird went back to the nest, while the other flew away. On this and similar subsequent occasions I was unable to determine if one bird fed the other, or if they merely caressed and resumed their former occupations, or if they exchanged duties.

At 12.20 p. m. and at 12.50 p. m. a singing bird was observed on the nest, but at 1.25 p. m. no bird could be seen near it.

At 5.15 p. m. I climbed to the nest, saw that it contained one egg, and descended at once. One bird watched me anxiously from the next tree, but uttered no notes.

The song which I heard during this day from the bird on the nest was the same, almost throughout, as that heard on June 13 from one bird while the other was nest-building. It appears, therefore, that one or more of the following hypotheses is true: (a) the male and female of this species both sing this same song, or (b) the female sings this song on the nest and also sings it while the male builds the nest, or (c) the male sits on the nest and there sings a good deal on the day on which the first egg is laid (as well as on subsequent days). In the absence of definite proof I can say only that I feel very doubtful about (b), but cannot choose between (a) and (c).

June 16. Cloudy, temperature 56° F. at 6.30 a. m. The nest was observed from 6.00 a. m. to 6.30 a. m., during all of which time one bird remained quietly on it. Two or three phrases of its song were heard. When sitting, the bird frequently lifted its head to gaze about. The nest was also observed at 7.05 a. m., 7.25 a. m., 12.15 p. m., 12.40 p. m., 5.25 p. m., and 5.55 p. m., at each of which times a silent bird was seen on it. At 5.55 p. m. I climbed to the nest. After I began to climb I did not see or hear anything of either Vireo. The nest contained two eggs, which were seen to be white, with a few small, scattered dark brown spots about their larger ends only.

It seems that there is a good deal of incubation from the day on which the first egg is laid.

June 17. A Philadelphia Vireo was seen incubating at 6.00 a. m., at which hour I climbed to its nest. When my hand was about two feet below the sitting bird, it slipped away quietly. The nest was then seen to contain three eggs. On the third egg was one spot which was nearer the small end than the large end; all the other spots seen on it were nearer the large end. I descended, and at 6.12 a. m. a Vireo returned to the nest by short flights. On arriving at the nest it gave one glance therein, then settled down on it. It remained there quietly until 6.30 a. m., when I left the vicinity. Evidently the third egg was deposited between 5.55 p. m., June 16, and 6.00 a. m., June 17, probably in the early morning hours of June 17.

A bird, which was not heard to sing, was observed on the nest at 4.25 p. m., 5.30 p. m., 6.00 p. m., and 6.50 p. m. At 6.50 p. m. I again climbed to the nest, which then contained three eggs only. The sitting bird departed quietly when my head was about a foot below it, and perched, facing me, on a limb some six feet away, in full view, showing its yellow underparts very plainly.

June 18. When I climbed to the nest at 5.00 a. m., one Vireo was on the eggs. When I was about a foot away the bird quietly left the nest, which still contained three eggs only. I reached the ground again at 5.03. The Vireo returned to the nest at 5.14, and, after a characteristic momentary inspection of its contents, settled on it. It sat there quietly until 5.45 a. m., then suddenly began to sing a slow, sweet song. The tone and quality of this song were similar to those of the singing previously heard, but the notes were for the most part quite different from any notes which I heard from any bird of this species at any other time. The song ceased at 5.53, after a duration of eight minutes. At 5.56 the bird shifted about a good deal.

At 6.00 a. m. I climbed to the nest again. When I was about three feet below it I stopped and looked at the sitting bird, which leaned far over the edge of its home and opened its mouth wide at me. It continued to hold its mouth open, without a sound, during most of the minute or two of this mutual inspection, although it closed it for a moment once or twice. This was the only occasion on which I observed any action of this kind. When I climbed further, so that my face was but a foot below the bird, it flew away silently. The nest now contained a complete set of four eggs, the fourth egg resembling the first two in having the scattered dots on the observable surface near the large end only. As I did not touch the eggs, I could not tell how they were marked on their lower surfaces.

It is evident that the fourth egg was laid between 5.14 a. m. and 6.00 a. m. It is also certain that the female can sing, and that her song is sometimes, at least, made up of notes differing from any heard from the male. The song heard on this occasion seems to have been in the nature of a little hymn of gladness and thanksgiving on the part of the female after the laying of her egg. Whether or not it follows the deposition of the last egg only I do not know.

For comparison it may be stated that a full set of eggs was found by Brewster¹ at Lake Umbagog, on the border of Maine and New Hampshire, on June 14, 1903, one was found by Seton, as mentioned by Brewster,¹ at Duck Mt., Manitoba, June 9, 1884, and full sets were observed by Philipp and Bowdish² in Northumberland County, New Brunswick, on June 17, 1916, and June 27, 1918.

The nest was observed at 7.25 a. m., 12.00 m., 5.00 p. m., 6.30 p. m., and 7.12 p. m., and a bird was seen on it each time except at 6.30 p. m., although no song was heard.

June 19. A Vireo was sitting at 6.00 a. m., when I began observation. It turned about frequently on the nest. At 6.20 a. m. I climbed the nesting-tree. The bird left as usual when I reached a point about a foot below it. I found four eggs only in the nest.

The nest was observed at 12.00 m., 12.25 p. m., 4.45 p. m., 5.40 p. m., and 6.45 p. m., and each time a bird was seen incubating, but no song was heard. At 6.45 p. m., I climbed to the nest again and observed that the eggs in it did not appear to have any regular plan of arrangement. They lay indifferently on chords or radii of the nest-circle, those lying on radii having either end outward.

June 20. The nest, with sitting bird, was observed from 6.00 a. m. to 6.30 a. m. The bird sang its low, sweet song several times, and paid not the slightest heed to repeated "squeaking" on my part. A bird was also observed on the nest at 7.25 a. m., 12.05 p. m., 12.40 p. m., 5.45 p. m., and 6.15 p. m., but no song was heard at those hours.

June 21. One of the Vireos was observed on the nest at 6.40 a. m. I did not see it leave its position there, but at 6.45 I heard one of the call notes of the species, which drew my attention to the fact that the nest was unoccupied and that the bird uttering the note was in the top of a Rock Maple next to the nesting-tree. This bird uttered one or two notes of song, then went to the nest and settled on it, continuing to sing there at irregular

¹ The Auk, XX, 1903, pp. 369-376.

² The Auk, XXXIV, 1917, pp. 265-275; and XXXVI, 1919, pp. 36-45.

intervals until I departed at 7.10 a. m. I am not sure whether or not this was a case of one bird relieving the other at incubation.

At 7.25 a. m., 12.45 p. m., 3.50 p. m., 5.50 p. m., and 7.15 p. m. a bird was seen on the nest, but no song was heard from it.

June 22. Cloudy, wind north, temperature 53° F. at 7.30 a. m. One Philadelphia Vireo was on the nest at 7.30 a. m., when I commenced observation. At 7.47 it quietly arose, stepped to a nearby twig, then flew away. I watched carefully for its return, but did not actually see it go on the nest, although it was there at 7.59 a. m., and I am sure that it was not there only a few seconds before. At 8.29 the bird quickly left the nest, seeming to fly directly from it to a nearby oak, where it fed. It returned at 8.34, and was still sitting at 8.55 a. m., when I left. It appears that at this stage of incubation, one week after the laying of the first egg, the nest is left uncovered while the incubating bird feeds. No song was heard during the morning.

At 3.45 p. m. a Philadelphia Vireo was heard singing in the oak woods, at a distance of four or five rods from the nesting-tree. At 4.03 p. m. the same song was being sung by a bird on the nest, which was probably the same bird. The song continued until 4.14 p. m., and when I observed the nest at 4.15 p. m. no bird was on it.

June 23. Cloudy, temperature 52° F. at 6.00 a. m. The nest was unoccupied at 6.00 a. m., when I began observation. I kept a careful watch for the Vireo, but failed to see it actually go on the nest, so inconspicuously did it return. It was on the nest at 6.13, but was not there a few seconds earlier. It remained there quietly until 6.30 a. m., when I left.

A bird was observed on the nest at 12.45 p. m., 5.20 p. m., and 6.00 p. m., but no song was heard from it.

June 24. A glance at the nest at 6.00 a. m. showed that a bird was on it. At 6.25 a. m. I resumed observation and found the nest uncovered. A bird returned to it at about 6.28 and remained there until 6.55 a. m. As its mate, during this time, was singing loudly and continually from the oak woods, it seems probable that the bird on the nest was the female. At 6.55 a. m. I climbed the nesting-tree. When my head was about five feet below the nest, I saw that the bird was no longer sitting, but

that it was perched on a small twig which sprang from the trunk about six inches below the nest. In these positions we looked at one another for some seconds, then I raised myself so that my head was about eighteen inches below the bird, which did not move except to turn its head slightly. The yellow of its underparts, though not at all pronounced, could then be seen plainly, and the lack of a black border to the crown was also noted again. After about twenty seconds of this close inspection, the bird flew silently away. On going to the nest I found that the four eggs appeared unchanged. At 6.59 I reached the ground again, and the bird went back to the nest at 7.06. It remained there until 7.45, when I ceased observing it for a time.

At 8.35 a. m. I returned to my observation-post. One Vireo (probably the female) was on the nest, while the other was singing loudly among the nearby oaks. At 9.02 no bird was on the nest, though I did not see the sitting bird leave. At 9.08 the female returned swiftly to the nest, while the song of the male, which had been sounding uninterruptedly from the oaks, was heard suddenly from the maple next to the nesting-tree. After a few seconds singing from the oaks was resumed. It is not clear whether the male had chased his mate back to her duties, or had simply escorted her back. The female was still incubating when I left at 9.35 a. m.

A bird was noted on the eggs at 11.45 a. m. At 7.10 p. m. one bird was on the nest, while its mate moved slowly through the branches from three to six feet away and sang sweetly for several minutes in an undertone.

June 25. At 5.58 a. m., when observation began, no bird was on the nest. I soon found the pair of Philadelphia Vireos feeding together in the woods, the male singing and following the female at a little distance as she flew from tree to tree. She seemed to lead him where she pleased, keeping to the lower branches of the trees. At 6.06 she returned to the nest, the male accompanying her to within a few feet of it, singing the while. He soon moved away again, still singing. I followed him to watch his feeding habits, and at 6.25 a. m. saw him suddenly fly to a point several rods away. As I pursued him I heard a scolding note once, followed by singing. I found that once more the female was feed-

ing, and that again he was following her through the branches. He did not seem to think of relieving her on the nest. It will be noted that in this part of the incubation period he did not appear to pay any attention to the absences of the female from the nest, except to follow her closely and sing while she fed. The female had not resumed incubation at 6.30 a. m., when I left. At 6.44 a. m. I happened to be near the nest again and saw the female return to it, escorted by the male in song.

A bird was seen on the nest at 12.00 m., at which time the male was heard singing nearby. He was still singing at 12.30 p. m., but no bird was then on the eggs. At 4.45 p. m., one bird was on the nest, and no song of this species could be heard.

At 6.41 p. m., when I climbed to the nest, the female was on it, while the male was in song about two rods away. The female continued to sit until some seconds after my head was a foot below her; then she peered over at me and flew off quietly. This was the first occasion on which she sat so closely. Before the eggs hatched the old birds never uttered a sound near the nest while I was examining it, nor did they usually appear at all after the one on the nest had left it. On this occasion the male, without approaching me, lowered his song to an undertone while I was examining the four eggs, which appeared unchanged.

June 26. A Vireo was observed on the nest from 6.10 a. m. to 6.25 a. m. and also at 12.00 m., 12.25 p. m., and 3.45 p. m. A light rain began about 12.15 p. m., and continued for the remainder of the day.

June 27. After a night of heavy rain, the day was cloudy and windy, without rain. The temperature at 6.00 a. m. was 67° F., but by 6.35 p. m. it had fallen to 56° F.

One bird, presumed to be the female, was observed on the nest at 6.00 a. m. At the same hour the male, whose song I had not heard earlier in the morning, began to sing in a loud voice from the top of a nearby oak. In less than a minute, still singing, he approached the nest rapidly by short flights from branch to branch. When he was about a foot below the brooding female she slipped quietly off the nest and flew directly away. The male then went to the nest and, after some turning and twisting about, settled himself upon the eggs, where he continued to sing at intervals in

an undertone. It will be observed that this first certain evidence of the male's participation in incubation was obtained twelve days after the laying of the first egg, which appears to have been coincident with the beginning of the incubation period.

At 6.16 the male began to sing more loudly, perhaps as a signal that he was ready to be relieved. At 6.17 he suddenly interrupted his song by a series of mouse-like squeakings and flew off the nest. His mate, who had approached the nest from the far side unobserved by me, then went on it immediately to brood. The birds did not actually meet one another during either of these exchanges of duties. The male proceeded to the oak woods, where he continued to sing loudly. The female remained on the nest until 6.30 a. m., when I left.

A bird was seen to be incubating at 12.00 m., 12.25 p. m., 3.30 p. m., 5.35 p. m., 6.35 p. m., and 7.10 p. m. The bird which was on the nest at 7.10 p. m. was heard to sing two or three times, and may have been the male. I climbed to the nest at 7.10 p. m., and found no visible change in the eggs.

June 28. One bird was observed on the nest at 5.57 a. m. A few seconds later the other bird, probably the male, approached the nest, uttering subdued musical notes. The sitting bird flew off and he took her place on the nest, where he sang at irregular intervals, now loudly, now softly.

At 6.04 I began to climb the tree, desiring to see if the male would sit as closely as did the female. He did so, remaining on the nest until after my head was but a foot below him, when he flew off in silence. The eggs showed no change. I descended at once, reaching the ground at 6.07. As I was climbing down the tree, I heard a few notes of song from the male in a nearby oak, and after I reached the ground these became louder and more frequent. At 6.09 a. m. the female went on the nest, while the male continued to sing loudly from his perch, making no move to escort her on.

At 6.29 a. m. I was watching the male singing in a small birch when his mate flew past me into the lower part of the tree. He immediately chased her into an oak and sang there for a minute or two, but at 6.31 he went on the nest himself and continued his singing there.

A bird was observed on the nest at 7.25 a. m., 12.45 p. m., 1.50 p. m., and 5.00 p. m., but no singing was heard after early morning.

June 29. The morning was fine and cool and the song of the Philadelphia Vireo was heard through the open window from 4.45 a. m. to about 6.30 a. m. At 7.34 a. m. I climbed to the nest and found in it four eggs, apparently unchanged.

A bird was seen on the nest at 11.46 a. m. At 11.50 I took my place to watch it. As it was singing slowly, I considered it to be the male. At 12.04 p. m. its mate approached with a mass of something, apparently food, in its bill. It perched within two or three inches of the nest, then flitted away a short distance, then went back to a perch beside the nest, then flew away again. The bird on the nest seemed to be undisturbed, and I could not see that the other bird fed it, or that it disposed in any way of the mass in its bill, or that the two birds touched one another at all. I have since wondered if this was the first noticeable result of an instinctive desire to feed the young, a desire which at this time could not be put into effective action. At 12.06 p. m. I was obliged to depart.

At 12.40 p. m., when I resumed observation of the nest, one bird was on it, and no song of this species was to be heard. At 12.52 the male began to sing in a low voice from the oaks, and at 1.05 he quietly replaced the female on the nest, where he continued to sing. At 1.11 the female relieved him and he resumed his singing in the oaks. At 1.14 I ceased observation for a moment, and when I returned at 1.15 the bird on the nest was singing, so that I presume that the male had resumed incubation during my absence. He was relieved by the female at 1.20, and he relieved her again at 1.36. She relieved him at 1.40, and he relieved her at 1.43. At 1.54 p. m. he left the nest and went to the oaks, where he sang a little. The nest was left uncovered until 2.02, when a bird went on it which I presumed to be the female, as it remained silent. I ceased observing at 2.05. During the hour and twenty-five minutes between 12.40 p. m. and 2.05 p. m. the pair had exchanged places on the nest eight times, the intervals between reliefs being sometimes as short as three, four, or six minutes. It is interesting to note that Allen¹ describes a

¹ *The Auk*, XXXIII, 1916, pp. 53-56.

similar rapid exchange of duties on the part of a pair of Rose-breasted Grosbeaks on the afternoon on which their young were hatched.

A bird was observed on the nest at 4.30 p. m. and again at 7.20 p. m., at which latter hour I climbed the nesting-tree. The bird on the nest sat as closely as had been usual for several previous days, but finally departed without uttering a sound. The nest contained three eggs and one young bird, but no pieces of egg-shell. I have not yet discovered how this species disposes of the shells of hatched eggs. The young bird did not raise its head while I looked at it. I descended quickly and the parent bird soon returned to the nest.

June 30. At 4.35 a. m. I climbed to the nest, frightening off the female, and found that it still contained three eggs and one young bird. When I touched the nest the young bird lifted its head and opened its yellow mouth for a moment, then dropped back to its prostrate position and would not stir again.

A bird was seen on the nest at 4.25 p. m. and again at 5.05 p. m. At the latter hour I went up to the nest and found that it held two eggs and two young birds.

July 1. One of the Vireos was observed on the nest at 9.27 a. m., and at 9.28 I climbed the nesting-tree. After I had reached my highest point, with my head about a foot below the nest, the sitting female still remained at her post, turning her head from side to side and eyeing me intently. The male was singing loudly at this time from the oak trees. Finally I raised my hand toward the female, which left the nest silently, disclosing one egg and three young birds. The young did not raise their heads or move at all when the nest was touched. Although they had been hatched on three successive days, I was unable, by looking at my mirror, to tell them apart. As far as I could see, they were all entirely naked, except that all had gray down on the upper surfaces of their wings and a few tufts of similar down on their heads.

The nest was observed at 11.00 a. m. and at 12.20 p. m., and a bird was seen on it each time.

At 4.30 p. m. I climbed to the nest and found no bird on it, although the male was singing nearby. About the time I reached the nest the female flew into the next tree and perched on a bare

branch in plain sight about ten feet away from me, where she watched me closely, but made no sound. In her bill she carried food, which looked like a small, whitish, naked caterpillar, and which she herself swallowed after a minute or two of watching. In the nest I could see no egg, simply a huddled mass of naked young birds. I inserted one finger among them and felt gently about until I assured myself that there was no egg there. At 4.35 p. m. I descended.

It will be noted that the first, second, and third young birds were hatched in fourteen days after the laying of the first, second, and third eggs, respectively. The time required for the incubation of the fourth egg lies somewhere between thirteen days, three hours, twenty-eight minutes and thirteen days, eleven hours, sixteen minutes. If all the eggs were warmed alike when a bird was incubating, and if the several eggs required equal amounts of incubation to cause hatching, it would appear that incubation began as soon as the first egg was laid, but that it was more broken and ineffective between the laying of the third and the fourth eggs than at other times.

At 4.37 p. m. the female returned to the nest, inspected its contents, and then flew away. At 4.41 she returned, carrying in her bill what appeared to be a small, dark, naked caterpillar. After feeding this to the young, she began brooding them. At 5.16 p. m. she suddenly left the nest and flew to another branch of the tree, but returned immediately to her brooding. At 5.38 p. m. she left the nest, being immediately replaced by the male, as I suppose. This bird left the nest at 6.18. At 6.21 a Vireo came to the nest and sat on its edge. It may have fed the young, but I could not see it clearly. After a few seconds it flew away again, but a bird came back at 6.24 and immediately resumed brooding. It left the nest at 7.14 and a bird went on the nest at 7.16. It left at 7.28 and one went on at 7.32. I cannot say whether these last observations were of two birds exchanging places or of one bird going and returning. During these three hours from 4.30 p. m. to 7.30 p. m. on this date the young were fed once, or perhaps twice at most. I ceased observing at 7.33 p. m.

July 2. The female was on the nest at 6.00 a. m., but the male replaced her at 6.27 and continued brooding until 6.34 a. m., when I departed.

A bird was observed on the nest at 12.00 m., 12.25 p. m., 6.10 p. m., and 7.09 p. m., indicating very steady brooding at this age of the young.

At 7.09 p. m. I climbed to the nest, the female Vireo sitting on it as closely as she had done on the previous day, but finally leaving in silence. The male in the oak trees sang steadily while I was climbing the tree, but became silent after the female had left the nest. The four young birds could now be plainly distinguished, although they still lay huddled together in an inert mass, with backs uppermost and with head and wings drooping, as though they were utterly exhausted. They were noticeably larger at this time than they were on July 1, and the down on them was more conspicuous. When the nest was touched one bird only lifted its head and silently opened its mouth for a moment, then collapsed again. On account of the way in which the birds were crowded together I was unable to observe whether or not they differed noticeably in size. I descended at 7.14. At 7.21 the female resumed brooding, and she was still on the nest when I left the vicinity at 7.26 p. m.

July 3. On this date I witnessed what appeared to be a family quarrel, although it may have been interference by some third adult bird. During it all I saw and heard but two Philadelphia Vireos in the vicinity, however, and they were quite evidently a male and a female.

Observation began at 6.16 a. m., when one bird was on the nest, while no song of the species was to be heard. No change was noticed until 6.24 a. m., when the male began singing among the oaks. A moment later, still singing, he flew to a perch near the nest. The next instant there was a series of excited squeakings, and both birds were away in a mad chase, fighting at frequent intervals with one another, apparently without mercy. They would circle around and around, passing repeatedly through the nesting-tree, then turn face to face in the air and struggle furiously, with much fluttering of wings and sharp clicking of bills, until often they fell nearly to the ground. After the first

few seconds the squeakings stopped and shortly afterward the male began to sing as he fought. As the birds passed through the tree they would sometimes alight for a moment, two or three feet apart. After the briefest of pauses the female would attempt to fly back to the nest, when the male would dash after her again and the fight would be resumed.

At 6.28 a. m., after four minutes of conflict, the female succeeded in getting back on the nest, where she uttered some song notes in a voice so low that they were scarcely audible. At the same time the male sang from a perch a few feet from her. At 6.29 he approached the nest, the female flew off, and another sharp struggle ensued. At about 6.30 the male flew to a distant oak, where he continued to sing, while the female disappeared. The female returned quietly to brooding the young at 6.36. At 6.44 the male ceased his singing and drew near to the nest by short flights from branch to branch. When he was but two or three feet away, the female flew from the nest, and the pair fought again, while the male sang. Mingled with the song I this time heard repeated squeakings and one utterance of the scolding note. At 6.45 the female went on the nest, where she uttered two loud song notes, while the male, in full song, returned to the oaks. At 6.46 the female left the nest and flew away, not going near her singing mate. The male soon stopped singing, but at 6.54 he began to sing from a tree near the nest, after which he went on the nest to brood, and there sang repeatedly in a low voice. A minute or so later he flew back to the oaks, where he sang loudly.

At 6.59 a. m. I climbed to the nest. Before I left the ground I could see no bird brooding, but when I arrived near the nest I found the female on it. She did not sit quite as closely as she did on the two previous days. The young birds appeared little changed, although the down on their heads was noticeably thicker and darker. When the nest was first touched two of them raised their heads and silently opened their mouths for a moment, but they would not repeat the movement.

A bird was seen on the nest at 7.25 a. m., 12.00 m., and 12.25 p. m. The nest was observed to be uncovered at 5.07 p. m., 6.06 p. m., and 6.38 p. m. At the last-named hour I climbed the

nesting-tree and found the young noticeably larger; fully twice the size that they were when first hatched. The down on their heads had increased and down had appeared across their backs between their wings. For the first time they were heard to utter a note, a simple "Peep, peep, peep," etc., very low and faint. It was loud enough to bring the female to my side, however, while the male began to sing from the oaks. Instead of being silent, as always when I was at the nest before, the female uttered excited squeakings (not the true scolding-note) from a perch within three feet of me. She soon became silent and disappeared. I reached the ground at 6.46 p. m., and, on stepping back to look at the nest, saw that the female had already returned to it.

(To be continued.)

NOTES ON ORTALIS VETULA AND ITS ALLIES.

BY W. DEW. MILLER AND LUDLOW GRISCOM.

A. THE STATUS OF ORTALIS V. MCCALLII BAIRD.

IN 'Isis,' 1830, page 1112, Wagler described *Penelope vetula*. A translation of the Latin is as follows: "Olivaceous; the head and ears slaty gray; the flanks, crissum, and tibia brownish; the epigastrium and belly subrufescent; tail feathers above bronzy green with snow-white tips. The length, 18 inches; longest tail feathers, 9.70; the shortest, 6.50. Mexico."

¶ In 1858 Baird¹ described *Ortalida mcallii*, the length being given as 23.50; wing, 8.50; tail, 11 inches. He admitted feeling considerable uncertainty as to the proper specific name of his subject. His description was based on one specimen from Nuevo Leon with no other Mexican material for comparison.

Ridgway² gives a synopsis of the races of *Ortalis vetula*. *O. v. mcallii* is given from Vera Cruz north to lower Rio Grande Valley; *O. v. plumbiceps*, described by Gray in 1867, from southern Mexico to Guatemala; and last he describes *O. v. pallidiventris* from Yucatan. It is significant that no *O. v. vetula* is given. In a footnote

¹ Rep. Expl. & Surv. R. R. Pac., IX, 1858, 611.

² Manual of North American Birds, 1887.

under *mccallii* Mr. Ridgway comments as follows: "It is possible that this (*mccallii*) may be the true *O. vetula* of Wagler, which seems to agree exactly in color with *O. mccallii*; but the size of the former is much smaller, the length being given as 18 inches, the tail 9.70. The locality is given as simply 'Mexico,' and it may be that a fourth local race, to which Wagler's name is strictly applicable, may exist in some portions of Mexico, specimens from which have not come under my observation."

So much for American expressions of opinion. In England Selater and Salvin revised the family in 1870,³ rejecting *mccallii* and other races described up to that time; a policy followed by all other writers except Sharpe in the 'Handlist of Birds.' He admits all the races described except *O. plumbiceps* of Gray from Guatemala and Honduras. He gives the range of *O. vetula* as southern Mexico to Honduras; and presumably, therefore, considers *plumbiceps* a synonym of true *vetula*. While Wagler's original description of *vetula* is seen to be very meager, this treatment of the question is obviously erroneous, as one of Gray's chief characters for his *plumbiceps* is the rusty white tips to the lateral tail feathers, which cannot be reconciled with the snowy white tips insisted upon by Wagler; while *plumbiceps* is a darker bird throughout.

It will be seen, therefore, that *O. v. mccallii* has no status abroad except for the 'Hand-list,' and that its sole character in American opinion is an alleged larger size founded on one specimen. Further, the combination *O. vetula vetula* has never been applied to any bird anywhere. An excellent series of the species before us shows that the supposed differences in size are easily accounted for by great individual variation, and further that Texas specimens actually average smaller than specimens from Mexico, the exact reverse of the supposed facts. Finally all these birds from Texas to Vera Cruz have passed in America as *O. v. mccallii*. As all birds from other Mexican localities and southward, of several valid races, do not possess pure white tail tips, it is impossible to identify any of them with *O. vetula* (Wagler). It is obvious therefore that *O. v. mccallii* Baird is a pure synonym of *O. v. vetula*

³ P. Z. S., p. 538.

(Wagler). This was described, be it remembered, from "Mexico." As there are now known to be several races in Mexico, and as we consider that Wagler's description is recognizable on the basis of the snow-white tail tips, we hereby designate Tampico, Tamaulipas, Mexico, as the type locality.

MEASUREMENTS OF WING.

S. Texas.....	6 ♂	194-214	8 ♀	186-204
Nuevo Leon.....	5 ♂	211-219	1 ♀	199
Tamaulipas.....	4 ♂	214-222	1 ♀	201
Vera Cruz.....	1 ♂	219	1 ♀	202

B. SYNOPSIS OF THE RACES OF *ORTALIS VETULA*.

A study of our material of this species shows not only that the various races described in the past, except *mccallii*, rest on valid characters, but also that there are two other races in Mexico that are undescribed.

We are indebted to Mr. Bangs for the loan of the type and two other specimens of *O. v. intermedia*.

1. *Ortalis vetula vetula* (Wagler).

Penelope vetula Wagler, Isis, 1830, p. 1112. Type-locality "Mexico"; by subsequent designation (Miller and Griscom, 1921) Tampico, Tamaulipas, Mexico.

As already mentioned, this race is characterized by snow-white tail-tips, and the crissum is devoid of any rufous tinge. In a large series from southern Texas to extreme northern Vera Cruz, Texas birds are usually lighter on the belly, and average smaller; but these differences in our opinion are too slight for subspecific separation.

2. *Ortalis vetula jalapensis* subsp. nov.

Subsp. Char.—Similar to *O. v. vetula*, but head darker gray; upper parts and wings decidedly browner; tips of the tail feathers ashy buff proximally to dirty white distally, never snow-white; middle of belly isabelline-brown instead of light ashy brown or whitish; flanks and crissum fulvous-brown, rather than buffy brown (Ridgway) or saccardo umber (Ridgway). Wing, 202; tail, 261; culmen, 21; tarsus, 62.

Type.—No. 68729, Amer. Mus. Nat. Hist., ♀ ad., Jalapa (alt. 4400 ft.), Vera Cruz, Mexico, April 7, 1897, coll. F. M. Chapman.

For remarks, see under the next race.

3. *Ortalis vetula fulvicauda* subsp. nov.

Subsp. Char.—Similar to *O. v. jalapensis*, but much darker; the upper parts deep olive-brown with no shade of gray; tail-tips dirty brownish buff proximally, paler distally; lower throat and breast much browner; belly scarcely paler than chest; flanks and crissum deep fulvous brown.

Type.—No. 74566, Amer. Mus. Nat. Hist., ♂ ad., Tolosa, Oaxaca, Mexico, Dec. 20, 1900, coll. by A. E. Colburn and Percy W. Shufeldt.

No.	Sex	Wing	Tail	Culmen	Tarsus
74566 A. M. N. H.	♂	207 mm.	267 mm.	25 mm.	65.5 mm.
74567 "	♂	211	260	25	64
74568 "	♂	208	255	26	65

Remarks.—This race is the dark extreme of *Ortalis vetula*, and can be separated at a glance from any other race. Our three specimens are all from Tolosa, Oaxaca, on the western slope of the mountains which form the boundary between Oaxaca and Vera Cruz. We have not been able to determine the altitude. *O. v. jalapensis*, from the eastern slope of the same mountains, is exactly intermediate between this race and *O. v. vetula* from the lowlands of northeastern Mexico, and intergrades might be expected. In spite of the fact that it is intermediate, however, it is told at a glance from the latter race by the difference in color of the tail-tips and other good characters, and seems, therefore, fully worthy of a name. In color it much more closely resembles *O. v. plumbeiceps* and *O. v. intermedia* with which it is not geographically related. From both it can be distinguished by the darker belly, which is much less contrasted with the chest and crissum; the crissum in the two other races is tinged with rufous. It is much larger than *intermedia*, and the tail-tips are not so strongly bicolored as in *plumbeiceps*.

4. *Ortalis vetula plumbeiceps* Gray

Ortalis plumbeiceps Gray, List of Birds, Part V, Gallinae, p. 11, 1867. Type locality, "Honduras, Guatemala."

This race was described from Guatemala and Honduras, and we are able to extend its range southward to the highland region of central Nicaragua, on the Pacific slope, where it is a common bird. We have seen no specimens from other localities. In color it is closest to *O. v. jalapensis*, a relationship which has al-

ready been discussed. Its chief character is the strongly bi-colored tail-tips, which are rufous to rusty proximally, and grayish buff to almost pure white terminally.

Measurements of this race as given by Gray are scarcely satisfactory:

No.	Sex	Wing	Tail	Culmen	Tarsus
102405 A. M. N. H.	♂	202 mm.	269 mm.	26 mm.	70 mm.
143644 "	♂	214	256	27	69
143645 "	♀	187	240	24	65

5. *Ortalis vetula intermedia* Peters.

Ortalis vetula intermedia Peters, 'Auk,' 1913, p. 371. Type locality, Camp Mengel, Terre Quintana Roo, Mexico.

This excellent race is the nearest approach to *O. v. pallidiventris*, and is a connecting link between it and *O. v. plumbiceps* further south. It is possibly the smallest of the races, and in this respect would not be intermediate, but our series is too small for final judgment. The best color characters by which to separate it from *plumbiceps* are the light isabelline instead of fulvous brown abdomen and the comparatively uniform tail-tips.

6. *Ortalis vetula pallidiventris* Ridgway.

Ortalis vetula pallidiventris Ridgway, Manual of North American Birds, p. 209, 1887. Type locality, "Yucatan."

This is the palest and grayest race of *O. vetula*, and is strikingly distinct from its nearest relative *O. v. intermedia*, the light grayish-olive back with no brown tinge being a unique character in the group.

Measurements of *pallidiventris* have apparently never been given. Two males from Chichen-Itza in the American Museum collection measure as follows: an adult—wing, 199; tail, 240; culmen, 23; tarsus, 70; and an apparently young bird—wing, 176; tail, 212; culmen, 24; tarsus, 68. It is closest to *intermedia* in size, with a proportionately longer tarsus.

The outlying forms, *O. v. vetula*, *O. v. fulvicauda*, and *O. v. pallidiventris*, if compared with each other alone, would unhesitatingly be given specific rank. The intermediate races, which serve as

connecting links, are on the other hand easily distinguished and geographically separated from each other.

C. STATUS OF *ORTALIDA RUFICRISSA* SCLATER AND SALVIN.

This species was described in 1870 in a footnote to the authors' Monograph of the Cracidae.¹ The single specimen came from Valle Dupar, on the south side of the Sierra Nevada of Santa Marta, Colombia, at an altitude of 400 feet. The authors compare it to *O. vetula*, but state that it is distinguished by the rufous crissum and the very broad white tips to the tail-feathers.

The type remained unique for over forty years, and the bird must be rare, as the collectors of Mr. Bangs and the American Museum of Natural History failed entirely to discover it. As a result it has had a chequered career. Sharpe omits it entirely in the 'Hand List.' Grant, in the British Museum 'Catalogue of Birds,' recognizing nothing but *O. vetula*, gives its range from southern Texas to Colombia. The species is also given by Salvin and Godman in the 'Biologia Centrali-Americana' in the synonymy of *O. vetula*.

The second known specimen was collected by M. A. Carriker, Jr., April 28, 1914, at Dibulla, Sierra Nevada de Santa Marta, and we wish to express our indebtedness to Mr. W. E. Clyde Todd, of the Carnegie Museum, Pittsburgh, for his courtesy in forwarding this bird for our examination.

There is no doubt of its close affinity to *O. vetula*. In plumage it is a curious combination of several races of *O. vetula*, but has certain characters all its own, which in connection with its geographical isolation, and the strong improbability of connecting links in Central America, entitle it in our opinion to specific rank. The special characters are: (1) the bright rufous-chestnut crissum, the nearest approach to which is in *O. v. plumbeiceps*. (2) The very broad pure white tail-tips, the extent of which is unique. Taking the third feather, and measuring along the outer side of the shaft, in *O. vetula* (including all races) the variation is 19.5–34.5 mm.; in *O. v. vetula*, 20–32 mm.; while in *ruficrissa* the white area measures 44 mm. (3) Forehead and feathers of malar

¹ P. Z. S., June 9, 1870, p. 538.

region, bordering the naked throat-patch, black instead of gray, due to the lack of development of the webs. (4) Central tail-feathers not tipped with lighter. (5) Tail proportionately shorter and less graduated. (6) Upper parts less uniformly colored than any race of *O. vetula*, the rump and upper tail-coverts browner. (7) Flanks light rufous. With these exceptions the head is similar to *O. v. plumbeiceps*; throat and chest nearest to *O. v. jalapensis*; belly intermediate between *O. v. intermedia* and *O. v. pallidiventris*, and scarcely differing from some specimens of *plumbeiceps*; anterior upper parts as in *O. v. jalapensis*, but rump and upper tail-coverts as in *O. v. fulvicauda*; tail-tips in color as in *O. v. vetula*. Soft parts (collector's notes): iris, red-brown; feet leaden blue; bill black apically, leaden basally. Wing, 212; tail, 253; culmen, 28; tarsus, 65.5.

The species will therefore stand as *Ortalis ruficrissa* Sclater & Salvin.

The following key is offered as a partial aid to future investigators:

- A. Light tail-tips more extensive (tip of 3rd rectrix 44 mm.); tail-tips pure white combined with bright rufous crissum. (Santa Marta, Colombia).....*O. ruficrissa*
- AA. Tail-tips less extensive (tip of 3rd rectrix 19.5-34.5 mm.); tail-tips not pure white, or if pure white, crissum not rufous.*O. vetula*
 - B. Tail-tips snow-white (S. Texas to N. Vera Cruz)....*O. vetula vetula*
 - BB. Tail-tips not snow-white.
 - C. Back grayish olive (Yucatan).....*O. v. pallidiventris*
 - CC. Back olive-brown.
 - D. Underparts darker and browner; middle of belly not lighter than chest (Oaxaca).....*O. v. fulvicauda*
 - DD. Underparts lighter and less brown; middle of belly noticeably lighter than chest.
 - E. Tail-tips noticeably bicolored, distinctly rufous proximally (Guatemala to N. Nicaragua).....*O. v. plumbeiceps*
 - EE. Tail-tips scarcely bicolored.
 - F. Entire underparts and tail-tips darker and browner; size larger, wing (♀) 202. (Mts. of Vera Cruz)
O. v. jalapensis
 - FF. Entire underparts and tail-tips lighter and less brownish; size small, wing 172-184. (Quintana Roo)
O. v. intermedia

American Museum Nat. Hist., N. Y.

FURTHER NOTES AND OBSERVATIONS ON THE BIRDS
OF HATLEY, STANSTEAD COUNTY, QUEBEC, 1919.

BY H. MOUSLEY.

THE season of 1919 has been the most eventful that I have experienced so far, during the past nine years. The weather conditions have not been altogether ideal, the great amount of humidity, and at times electricity in the air, making field work somewhat trying. The month of June was unusually hot, more nearly resembling July than Junes of former years, the temperature in the first week, ranging from seventy degrees in the early morning, to over ninety in the afternoon, and this state of things lasted on and off, more or less, throughout the remainder of the month, and that of July also. This prolonged spell of heat had a marked effect on the bird life of the district; judging from the increased number of Ruffed Grouse to be found in the fall, as compared with the last two or three years, when very wet Junes, depleted the young broods to an alarming extent. Strange to say, the very cold winter of 1917-18, as I have already remarked in my paper in 'The Auk' for October, 1919, produced a number of very early spring records, whereas the comparatively mild and open one of 1918-19, which one might naturally have expected to give rise to a crop of these records, failed to produce anything very startling. Two Robins were, however, seen on March 2, eighteen days ahead of time, and Prairie Horned Larks appeared on February 18, ten days ahead of any previous record. A Crow was seen on February 13, and a Brown Creeper on March 21, the former being twelve days ahead of time, and the latter twenty-three days. These four items, however, form the principal early records, although there were about a dozen others, which ranged from one day to seven days in advance of former years. In the fall however, the hot summer and comparatively mild weather prevailing towards the end of September, seem to have given rise to some unusually late records, especially amongst the warblers, the Nashville, Tennessee, Northern Parula, Magnolia, Black-poll and Blackburnian, being found well into the first week of October—a thing that has never occurred before.

Some of these records, such as that of the Nashville and Blackburnian, are as much as twenty-five days later than in previous years, the first named being seen as late as October 18, whilst the Ovenbird, Bay-breasted, Cape May and Chestnut-sided Warblers lingered into the last week of September, these records also ranging from eight days to twenty-two later than in previous years. The records of the Limicolae have been few and far between, owing to the almost drying up of "the marsh," but I was fortunate on June 2 and August 7, in observing two Semipalmated Sandpipers, a bird that has been absent for the past three years. This last remark applies almost equally well to the Lesser Yellowlegs, Pectoral Sandpiper and Semipalmated Plover, birds that at one time I used to see more or less regularly every year, but which now seem to have entirely deserted the district. A Wilson's Snipe was observed on April 27, and again in the fall on August 24, both of these dates forming early records. A couple of Killdeer (a bird rare in these parts) were on the marsh on August 11, and a pair were seen in a dry hilly pasture, about seven miles from Hatley on May 6, which may possibly have remained to breed. Two other noticeable features were the late arrival of the Solitary Sandpiper, which was not seen until May 23, and the failure of the Great Blue Heron to put in an appearance at all, in the spring, such events never having occurred before. Of the ducks, a pair of Black Ducks put in a record appearance on April 6, as well as two male Red-breasted Mergansers on the thirteenth, and in the fall I obtained a couple of female Blue-winged Teal on September 17, a bird I had never personally seen on the marsh before, which remark applies also to the Mergansers, although they both occur occasionally on Lake Massawippi. But by far the rarest visitors to my little marsh were a pair of Shovellers on May 31, and a Black Rail on September 23, both species being new to my list, and both of them being rare anywhere in this part of the country. Reverting to the land birds again, the only remarkable absentees were Meadowlarks and Migrant Shrikes, the former being seen on six occasions only, throughout the summer and autumn, whilst the latter was only noticed once on April 8. As an offset to this, Baltimore Orioles, Purple Finches, Goldfinches, Ruby-throated Hummingbirds,

Swamp Sparrows and Blue Jays were unusually numerous, whilst the Black-billed Cuckoo was seen more often than usual. Amongst the warblers, the Cape May, Black-poll and Wilson's, were observed both in the spring and fall, the two latter being seen on more occasions than in any previous year. In the spring, however, the Black-poll kept up its reputation for rareness, only one male being seen, the same as in 1917 and 1918, which fact still further strengthens my already expressed opinion that this species does not pass to its northern breeding grounds by way of Hatley. In the fall, however, judging from last year's experience when seven birds, and again this year when thirteen were seen, it now looks as though a portion of the birds pass through Hatley on their return journey south, arriving from the north probably by way of the St. Francis River. At all events this state of things has existed for many years past, both at Montreal and Quebec, where in spring the birds are scarce, but in the fall more general, the same as they are apparently now at Hatley. An unusual wave of the rarer Tennessee Warblers took place in May, when between the twentieth and twenty-sixth, no less than twenty examples were seen. The greatest surprise of all, however, was the obtaining of an example of the rarest of eastern warblers, the Orange-crowned, on September 29. The Warbling Vireo, a bird hardly ever seen since the great Vireo year of 1912, bred in a maple tree opposite my house, and the Philadelphia, the rarest of the Vireos, and a bird I saw only for the first time last year, and that very imperfectly, was quite abundant in the fall, as from September 1 to October 1, I saw it on eight occasions, and obtained two or three examples. I hope this Vireo may be swinging this way, for it is certain from what I now know of it, that it has not been here before last year. otherwise I could hardly have failed to notice it. When seen, it was always in the company of Chickadees or Warblers, more especially the latter—its smallness, sleek appearance and entire yellow underparts being good field marks, differentiating it from the Red-eyed and other Vireos. My little House Wrens bred again in the same locality as last year, this being the only pair I know of in the district. Another pleasing item in connection with this Wren locality was the finding there of a nest of the Olive-sided Flycatcher, and

thus being able to add this somewhat rare and uncommon bird to my breeding list. The nest which was located on July 23 was saddled on a branch of a spruce tree, 37 feet above the ground, four feet from the trunk, and five feet from the tip of the branch, and was composed outwardly of coniferous twigs and usnea lichen, which latter also formed the entire inside lining. Its dimensions were: outside diameter five, inside two and a half inches; outside depth two, inside one and one-eighth inches. What it contained on this date I cannot say, but certainly not young birds, or even incubated eggs, judging from the behaviour of the parents. I was unable to climb to it, and had later on to cut down the tree, before I could obtain possession of the nest. In locating it I adopted the tactics explained in my "Singing Tree" paper¹ and the system worked splendidly, the nest being found well within the magic circle, or just thirteen yards from the favorite "singing" or "observation" tree of the male. This nest was presented *in situ* to the Victoria Memorial Museum at Ottawa, together with that of the Warbling Vireo mentioned above. In the case of the latter, the male sang almost as frequently from the same tree that the nest was in, as he did from an apple tree six yards away. The same thing happened again, when the second nest was constructed, the male occupying the nesting tree, which in this case was also a maple, almost as much as he did the old maple, the site of the first nest, and which he now used as his favorite "singing" tree, it being seventeen yards from the new nest. The time occupied in building the second nest, and laying a fresh set of eggs (which I did not molest), was eleven days. Both nests were in similar situations, and both were alike in construction, in fact everything except height above ground conformed to the tables given in my paper, "A study of subsequent nestings after the loss of the first."² Referring to this paper, I was surprised to find that I had not drawn attention to the somewhat interesting fact that second or third nests, as a rule, are built in higher situations than the first, the same as this Vireo's was, the second nest being thirty-seven feet above the ground, whereas the first was only sixteen feet. Can it be that some intuitive or tele-

¹ Auk, Vol. 36, 1919, No. 3, pp. 339-348.

² Auk, Vol. 34, 1917, No. 4, pp. 381-393.

pathic influence prompts birds to seek a higher and safer site for their second or third ventures, or is it merely a coincidence in the cases that have come under my notice? It is an interesting problem and will repay further study. Dr. Chas. W. Townsend's Labrador Chickadee (*Penthestes hudsonicus nigricans*) and the Acadian (*Penthestes hudsonicus littoralis*) were both seen and obtained, the former on August 27 and September 26, and the latter on August 12 and September 17, and I can only repeat that the shyness of the former was, as on former occasions, in striking contrast to the tameness of the latter. Possibly the event that gave me as much satisfaction as any was the taking of an example of the Short-billed Marsh Wren (*Cistothorus stellaris*) on September 10. A sight record which I had previously made in May, 1917,¹ may have been looked upon by some with a certain amount of scepticism, and, in thus vindicating myself, I had also the pleasure of being the first to definitely add the species to the Quebec list. The present site was about three miles south of that previously recorded, but the nature of the ground was identical—a low damp meadow—much overgrown with long, rank, tussocky grass, and with a small stream running through the center of it. The bird flushed near this stream, from a tuft of grass, and alighted for a few seconds, low down in an alder bush, and this time I was taking no chances but fired instantly, although at very short range. I sent the bird in the flesh to the Victoria Memorial Museum at Ottawa, and Mr. Taverner tells me they have been able to make quite a respectable skin of it. On September 24, I came across my first Gray-cheeked Thrush. Of the Hawks and Owls I have not much to record, except that an example of Cooper's Hawk was shot on a farm near my house on September 1, whilst in the act of killing a fowl, this bird being new to my list. A Screech Owl (in the gray phase) was taken alive on the veranda of Mr. A. Nichol's house in the village on March 14, but died the following day. This bird was given to me in the flesh and has since been mounted by Mr. Greer, and is now in my possession, it being the second record only that I know of for the district. Wilson's Snipe, which have been re-

¹ Auk, Vol. 35, 1918, No. 3, p. 305.

ported as unusually abundant near Quebec, have almost failed to put in an appearance on the marsh—one on the early date of August 24, and three on September 14 being all that I have seen. A Bobolink was caught on the marsh on October 12 with a damaged wing, but otherwise it was in fine condition and plumage. White-crowned Sparrows were seen on September 18, and Tree Sparrows, which appeared on September 26, are still here October 31. These are the earliest fall dates I have. Fox Sparrows, which are always scarce, were noted on October 20, but only two examples. The last Myrtle Warblers lingered until October 22, just two days short of my previous latest record—October 24, 1916. Having now given a general idea of the season, I will proceed with the annotated list of the new species added since 1918, carrying on the numbering from where it previously left off.

169. *Spatula clypeata* (Linnaeus). SHOVELLER.—Very rare transient; May 31, 1919. I am indebted to my younger son for being able to add this rare migrant to my list. He and a friend had been fishing in the marsh on the above date, and on coming home to dinner at noon, he casually remarked that they had seen a pair of ducks, one of which was very handsome, and both had very large wide bills, and had allowed a near approach. It can be imagined I hurried through the meal, and at once made for the marsh, and there at the far end, riding lightly on the water, were a pair of Shovellers, which allowed me to approach and watch them for some considerable time, within a distance of twenty yards or rather less. At this range, it required neither a gun nor yet field glasses to prove their identity, for irrespective of the brilliant colors of the male, their extraordinary bills alone formed an easy field mark for identification, and one which my young son had not failed to notice. At length I moved, and the motion I suppose after remaining still for so long, must have startled them, for up they got and headed in the direction of far-off Saskatchewan or thereabouts, where I hope they were successful in rearing a brood, and that next year they will visit "the marsh" again. They are somewhat small ducks, and the female and young at long range, if the bills were indiscernible, might be mistaken for female Blue-winged Teal.

170. *Creciscus jamaicensis* (Gmelin). BLACK RAIL.—Very rare transient; September 23, 1919. Whilst crossing a little stream running through the center of "the marsh," on the above date, I had occasion (owing to the treacherous nature of the ground) to make use of a small

tree trunk that spanned the stream. Finding I was losing my balance by going slowly, I finished the remaining portion of the trunk at a run, as one often does in such cases, and landed with some little impetus in the swampy grass on the other side. Judge of my surprise, when up got a tiny dark bird from almost under my feet, and with feeble and hesitating flight, made for the nearest cat-tail bed just twenty yards distant, into which it dropped abruptly, as if utterly exhausted by its vain endeavors to simulate anything approaching a speed flight. I should certainly have hesitated in publishing this record, had it not been for the fact that the instant the bird rose, the one thing, after its smallness, that impressed itself upon my mind, was the somewhat light appearance of its hind parts, both upper and under, caused by the white spotting and barring, important identification marks, which at the moment were not fully realized, it being a very long time since I had seen a mounted example of the bird. Its flight of twenty yards to the cat-tail bed was low and direct and not more than three feet above the ground. I had ample time to note the plumage through my field glasses, and I am prepared to say with almost the same equal confidence, as I did when giving the sight record of the Short-billed Marsh Wren in May, 1917, that so far as human judgment is free from errors, and can be relied upon, I neither confused the present bird with the young of the Virginia, or any other rail.

171. **Accipiter cooperi** (Bonaparte). COOPER'S HAWK.—Not common transient. On September 1, 1919, a bird of this species was shot by Mr. Albert Hodges on his farm, about a mile and a half to the south of the village, whilst in the act of killing a young fowl. It was shown to me in the flesh on the same day, and proved to be a young male weighing ten ounces. I was able to identify another on September 15, 1919, coming upon it unexpectedly, and thereby getting a good view of it. As far as my experience goes, it appears to be somewhat uncommon here.

172. **Corvus corax principalis** (Ridgway). NORTHERN RAVEN.—Probably now a rare or accidental straggler, but once occurring more generally. In 'The Canadian Naturalist,' 1840, Gosse (who, it will be remembered, once resided near Hatley) speaks of the Raven on page 167 as follows: "The Raven (*Corvus corax*) occasionally sails over our heads, as he appears to visit nearly every country; but he is not a common sojourner with us; or if he is, he must be generally mistaken for the crow, the chief difference being his superior size." In view of the above facts, I think the Raven is fairly entitled to a place in my list, as no doubt before Gosse's time, when the country was in its wild and primitive state, the Raven may even have bred here. Personally, I cannot speak with any degree of certainty of ever having seen one, although on one or two occasions, certain single crows have appeared to look larger than usual, but this may have been merely light and shade playing a deceptive part.

The only real test I suppose in such cases, would be the seeing of the supposed larger crow, in company with a few real crows, when its greater size, if it was a Raven, would be apparent.

173. *Melospiza lincolni lincolni* (Audubon). LINCOLN'S SPARROW.—Rare fall transient; September 25 to October 15. This sparrow was first seen on September 25, 1918, but through an oversight was omitted to be recorded in my notes for that year. I have not yet come across it in the spring, and only a very few examples have been seen or taken in the fall so far. It is very secretive, and never more than two have been found together, frequenting the hedges and bushes bordering roadsides and fields.

174. *Vermivora celata celata* (Say). ORANGE-CROWNED WARBLER. Very rare transient; September 29 and 30, 1919. It was on the first of the above dates, whilst on my way to some favorite hunting grounds, that my attention was attracted to what, at first sight, appeared to be a somewhat large and dull-colored Nashville Warbler, and I might have let it go at that had not my late constant study of warblers in the field told me that here was something new. On collecting it, judge of my surprise and pleasure to find that not only had I secured the rarest of eastern warblers, the Orange-crowned, but had also created a fall record for the bird, in the Province of Quebec. The only other existing records are one by the late E. Wintle, of a bird taken at Montreal on May 31, 1890, and one by C. E. Dionne, of a bird seen near Quebec on May 13, 1890. In Knight's 'Birds of Maine,' published in 1908, the Orange-crowned Warbler is only included in the hypothetical list, with the inference that there is no authentic instance of its occurrence in the State. In Allen's 'Birds of New Hampshire,' published in 1903, one spring record is given, that of a single bird taken May 16, 1876, by Dr. W. H. Fox at Hollis. There is no autumn record. Miss Alice W. Wilcox, formerly director of the Fairbanks Museum of Natural Science at St. Johnsbury, Vermont, stated in 1916 that so far as she knew, no record of the Orange-crowned Warbler had been made in that State. The above references will, I think, give some idea of the rareness of the bird in these parts, and my good fortune in securing this example, which I sent in the flesh to the Victoria Memorial Museum at Ottawa. On the following day I again visited the vicinity, and my attention was attracted to another individual. This one was flitting about in some small birch trees, on the outskirts of a large wood, in company with two Philadelphia Vireos and a mixed flock of warblers, amongst which was a Blackburnian, two Bay-breasted, two Northern Parulas, and one Nashville, besides many other commoner ones. I had many opportunities of watching this bird, (for I did not molest it), both during the morning and afternoon, and of hearing its sharp metallic chip. In habits it reminded me more of a Nashville than anything else, hopping and flitting about, whilst incessantly

gleaning small insects, and ever and anon giving vent to its sharp chip. I never saw it frequent a coniferous tree, its favorite hunting area being a batch of small birch trees, in several of which it would spend long intervals at a time, going very carefully over them in its incessant search, I presume, for the small aphides that infest these trees. I might here mention that the bird obtained the day previous was shot from a sapling aspen, so that it looks as if small deciduous trees, and no doubt shrubbery, are preferred to coniferous or the taller deciduous trees.

175. *Hylocichla aliciae aliciae* (Baird). GRAY-CHEEKED THRUSH.—Rare transient; September 24, 1919. For some years I have waited in vain for a fitting opportunity of recording this thrush, for although I think I have seen it on two or three occasions, the view has never been sufficiently long or convincing enough to warrant its inclusion in my list. However, on the above date I came unawares upon a thrush standing in a very erect posture, on the bough of a small birch tree, and the light being good I was able to see distinctly that there was no perceptible buffy tinge on either the eye ring or cheeks, the breast being only slightly tinged with this color. In addition to this, the bird certainly struck me at once as being somewhat larger than any thrush I had come across before, and for these reasons I have no hesitation in now including it in my list of Hatley birds, especially, as very soon afterwards, I was able to compare it with an Olive-backed Thrush, which was also in the immediate neighborhood.

Hatley, Que.

BOHEMIAN WAXWING (*BOMBYCILLA GARRULA*) IN NEW ENGLAND.

BY HORACE W. WRIGHT.

ON February 12, 1919, in a walk around Chestnut Hill reservoir, Boston, I came upon a flock of about thirty Cedar Waxwings (*Bombycilla cedrorum*) in a plot of berry-bearing shrubs situated near the reservoir basin. The Cedarbirds were flying back and forth from one shrub to another for the berries and were giving their characteristic sibilant notes. But I heard another call than theirs, and yet saw no other bird than waxwings. The call consisted of several *chips* given in close repetition, not as separate calls, but forming one call, slightly rolled together like a short trill and constituting a chatter, repeated after an interval. Soon the bird from which these calls came, presented itself fully to view upon a branch of a low tree standing among the shrubs

and rising some ten feet higher than they. In size it was distinctly larger than the Cedarbirds, and gradually all the features which differentiate *garrula* from *cedrorum* were clearly observed one after another; namely, the entire absence of yellow on the underparts, which were pure gray; the definite chestnut patch of the under tail-coverts; the tint of a similar color on forehead and cheeks extending up on to the crest feathers, especially the sides of the crest; the greater size of crest as compared with that of *cedrorum*; the tips of the primary coverts and secondaries white, definitely so marked, but not conspicuously, indicating, perhaps, the individual as a female or immature male; an absence of yellow on the tips of the primaries, further suggesting that the bird was not an adult male, although the variation in these markings may be individualistic and not due to sex or age. It also lacked the red sealing-wax-like tips to the secondaries, and the band of yellow at tip of tail was not broader than *B. cedrorum* possesses.

This Bohemian Waxwing was again seen on the 17th, when Mr. A. W. Upham was my companion. As before, it was in company with a flock of Cedar Waxwings, on this second occasion numbering about forty birds, and the flock was feeding in the same plot of shrubs. The chatter call was again heard, but only two or three times. And presently the flock took wing far away over a neighboring hill, gone evidently for a while or until desire for food would bring it back again. My first observation had been for a half-hour from about 11.30 to 12 m., and I had then left the flock in the locality where found. This second observation was at about 9.45 a. m., and within ten minutes the flock took its long flight over the hill. We were interested to observe that in their flight the Bohemian closely accompanied its companions, but all the time a little separated from the close bunch which the Cedarbirds constituted, and appearing even at considerable distance in the sky distinctly larger than they.

Mr. Upham has given me this description of the note or call as he heard it on this occasion, and the description has the value of being given by one whose ear has been musically trained. Mr. Upham states: "Of course, I only heard it two or three times. The note or call that I listened to, I would describe in this way—a short, rapid, wooden, and unmusical trill. The Maryland

Yellow-throat has a call which bears some resemblance to it, and it seemed to me that it is very much like the peculiar 'chatter' of the Barn Swallows, with which they intersperse their more musical twitterings."

Mr. Charles E. Clark has informed me that on the 16th he saw the *B. garrula* with the flock of *B. cedrorum* between 9 and 10 A. M. near the bank of the reservoir at a point only slightly removed from the plot of shrubs. He states that the *garrula* was first seen perching on a large bough of an oak tree standing beside the park drive, and the *cedrorum* were flying back and forth to red cedars on the bank; that it took several mouthfuls of melting snow, there being a small accumulation on the larger branches, and visited a nearby cedar.

On February 18, Mrs. Edmund Bridge, Miss Annie W. Cobb, and Mrs. E. R. Jump together had an interesting observation of this Bohemian Waxwing. Mrs. Bridge informs me that they reached the locality about 9.15, and that the flock was in the plot of shrubbery when they arrived. Mrs. Bridge states: "The Bohemian Waxwing kept rather to itself on a bare twig. The only note heard was a loud, oft-repeated *chip* like a Chipping Sparrow's call." It is further stated that the birds after feeding on the berries flew down upon the stones embedded in the shore of the reservoir and drank, and then about 10 o'clock, as on the preceding days, took their long flight over the neighboring hill.

Mrs. Grace King Earle reports that with her son she observed this Bohemian Waxwing, together with a few of the flock of Cedar Waxwings, on February 24, at 8.30 a. m.; the birds were still feeding in the triangle of shrubs. Mrs. Earle writes: "My son noted that the Bohemian Waxwing gave a sort of harsh rattle. In their flight the Bohemian kept quite a little to one side of the others."

Miss Bertha E. Davis informs me that on March 2, between 9.30 and 10 a. m., she saw this flock of Cedar Waxwings with the Bohemian in the same locality and was impressed with the Bohemian's quite distinctive note.

Miss Nora K. Holman writes that on this same day, March 2 in the afternoon at about 3.15, she saw this Bohemian Waxwing with about twenty Cedarbirds in hawthorns near the shore of the

reservoir, feeding on the berries. Miss Holman states that she viewed the Bohemian at a distance of ten feet only and observed the chestnut under tail-coverts.

I visited the Chestnut Hill section on February 28, March 7, 20 and 22, but saw no waxwings on either occasion. On March 22, however, as I approached the grounds of an estate on Hammond Street, just westward from the reservoir, I heard a noisy chatter unlike any bird voicing with which I had been familiar, but unfortunately this chattering ceased before I had opportunity to investigate, and I was, therefore, unable to determine whence it proceeded. I saw no waxwings, but the chatter was very suggestive of the notes I had heard when viewing the Bohemian on the first occasion, February 12. I am informed that many observers from day to day unsuccessfully sought to see this Bohemian after its presence had become known. But the wandering habit of waxwings would explain its lack of continuous daily constancy to one location, although occasionally reappearing there up to March 29, when its latest appearance was recorded.

It may be mentioned that on January 30 I had noted a flock of about thirty Cedar Waxwings in a big willow standing beside Beacon Street as it leads by the reservoir to Newton, and less than an eighth of a mile from the feeding ground later adopted by the flock. But on this occasion I heard no other calls than the lisping notes of the Cedarbirds, and upon looking the flock over they all appeared to have the yellow underparts. So my inference is that the Bohemian Waxwing, which became a companion of the flock, was not present with it on January 30. If it is correct to assume that *B. cedrorum* had moved up from the south on the early migration which brings the species to eastern Massachusetts in late January and in February, and that the *B. garrula* had gradually extended its flight from the far northwest along the northern tier of States to Boston, we may assign the meeting of the two types to a time between January 30 and February 12, on which date we have our first knowledge of the presence of the Bohemian. One individual only was seen on the several occasions. This bird evidently gladly availed of the companionship which its more southern relative afforded and became a constant member of the flock of *cedrorum*, without,

however, becoming an integral member thereof, as evidenced by its slight separateness in their longer flights and also when perching, which suggests that, when the time came for its return across country for northwestward, it would experience no difficulty in making this habitual slight separateness a complete separation.

Several other records of Bohemian Waxwing in Boston and vicinity in the season of 1919 have come to my knowledge through Mr. E. H. Forbush, State Ornithologist of Massachusetts, who has kindly placed them at my disposal, furnishing me the names and addresses of the several observers, that I might receive direct from them such detailed testimony as they were able to give.

Mr. A. M. Wilcox, of the Roslindale district of Boston, writes me that he saw five Bohemian Waxwings there about January 20, feeding on *Crataegus* berries; that they were seen twice in the same tree within an hour; that no Cedar Waxwings were with the Bohemians nor any in the near vicinity; that the distinguishing characteristics were the larger size and conspicuous white color on the wings; that he watched all winter and spring, but failed to observe the species again; that he is well acquainted with the common Cedar Waxwing; and that he has no doubt of the identification.

Miss Addie B. Hobbs states that at Essex, in the afternoon of March 8, she saw a Bohemian Waxwing with a large flock of Cedarbirds; that they seemed restless and easily disturbed; that each time they flew one bird remained somewhat behind the others; that resorting to a creeping approach she at length got within close range of the laggard of the flock and saw that it was a grayer bird than the Cedar Waxwings; that, as it turned, the white in the wings showed very plainly; that its crest had a ragged look compared with those of the Cedarbirds; and that it seemed quite fearless.

Mrs. George H. Mellen, of Newton Highlands, testifies that on March 29, the morning being cold and stormy, when at breakfast about 7.45, she saw from the dining-room bay a large flock of birds approaching the house. The flock settled on the trees and ground just outside. Quickly procuring her glasses, Mrs. Mellen perceived a Bohemian Waxwing about twenty feet from the window. She states that the thing which impressed her

most was the distinctness with which the bird stood out from the rest of the flock; that she had supposed detection would be difficult, but that no one accustomed to bird study could have failed to notice this bird, if looking over the flock with care. Everything was covered with wet, slippery snow, and all the birds were in more or less unusual attitudes as they could not find foothold. The Bohemian had his tail pushed down, much the same as a woodpecker, or as a Song Sparrow droops his, and thus well displayed the under tail-coverts. There were seventy-five to eighty birds in the flock. Mrs. Mellen's home, "Birdbanks," is about two miles from the Chestnut Hill reservoir in an air line, or possibly somewhat less. It is not unlikely that the Bohemian which she observed on March 29 was the bird which had been seen repeatedly in the grounds of the reservoir. And yet, in the light of the testimony which has been gathered, it may not unlikely have been another individual.

Mr. and Mrs. Gordon B. Wellman found a Bohemian Waxwing with a flock of about forty Cedar Waxwings beside a reservoir in Malden on April 25. On the following day, in company with them and Mrs. Edmund Bridge, I viewed the bird in the same locality, and it was again seen by the Wellmans on April 27. This was an occurrence of the species much later in the season than would be expected, and indicates that the Bohemian Waxwing, like the Evening Grosbeak, may be slow in taking its return flight to its far northern breeding grounds. My own records of Evening Grosbeaks indicate that ten individuals were still present in Chusted Park on the Brookline side on May 6, 1916, and I was informed that still later records of a few individuals there were obtained.

Dr. Thomas Barbour, in the October, 1919, issue of 'The Auk,'¹ states that at Beverly Farms, Massachusetts, there still remained in May [1919] a portion of a flock of seventy-five to a hundred Evening Grosbeaks which had appeared there about March 10, which portion was first seen about May 14 and did not disappear from the neighborhood until the night of May 19. Mr. F. C. Smith, in the same issue of 'The Auk,'² states that from May 5

¹ 'Auk,' XXXVI, Oct. 1919, p. 572.

² *Ibid.* p. 573.

to 10 [1919] at Boonville, N. H., he daily observed a flock of twenty Evening Grosbeaks, but that when again there on the 15th he could not find any of the birds. Thus it may be regarded as not unusual for some Evening Grosbeaks, when there has been a visitation of them during the winter and spring, to remain well into the month of May before disappearing.

Three other Massachusetts records for the season of 1919 which Mr. Forbush has transmitted to me, all from the western section of the State, are:

Greenfield, on testimony of Mr. Lyman T. Ruberg in a letter of March 10. Mr. Ruberg writes: "On Tuesday, February 25, about 10.30 A. M., I saw two Bohemian Waxwings. They were feeding on sumac tops in the Green River Valley, about four miles out of town. I should say that they were both males, as the wing markings were very distinct and the crest was prominent. I had a good look at them and am certain what they were. These birds were alone, no others with them." Mr. Ruberg has been a deputy fish and game warden for several years, Mr. Forbush informs me.

South Deerfield, on testimony of Mrs. J. E. Richards, who writes under date of February 26: "Last week two Bohemian Waxwings visited us. We know that they were not Cedarbirds from the white on the wings. We did not see the chestnut under tail-coverts of the waxwings, but they were not Cedar Waxwings. Of that we are sure. They flew before we had time to note every distinguishing mark." Mrs. Richards is well known by Mr. Forbush as a reliable observer.

West Stockbridge, on testimony of Miss Lottie Kniffin, who states that on February 1 she saw eight or ten Bohemian Waxwings, "white on wings very distinct." Mr. Forbush regards Miss Kniffin as "a very careful and modest observer" who "seems to know birds very well indeed."

These are the records for Massachusetts in 1919, so far as they have come to our knowledge. They constitute a striking contrast to the very few records of all previous years. The species has been so rare in Massachusetts that I had not before seen one, and fellow members of the Nuttall Ornithological Club of Cambridge, who have had life-long experience, in field observation, testify that they have never seen one in the State in the wild.

In Howe and Allen's 'Birds of Massachusetts,' published in 1901, nine records are given, namely: a pair near Boston in the autumn of 1832, seen by Audubon's sons (Audubon); a large flock, Boston, of twenty to thirty birds in mid-winter about 1844 (Baird, Brewer and Ridgway); one shot at Williamstown prior to 1858, and now preserved in the Williams College Museum (Chadbourne); eleven specimens captured at Bolton by S. Jillson in January, 1864 (Allen); one seen by Mr. William Brewster in the Cambridge Region [Watertown] in October, 1869 (Allen); several taken near Worcester prior to 1870 and recorded as in the possession of Dr. Henry Bryant (Maynard); a female taken at Lynn on February 18, 1877, by Mr. N. Vickary (Brewster); it is stated, "This is doubtless the specimen labelled 'Lynn' in the collection of the Museum of Comparative Zoology, Cambridge"; [this specimen has recently been transferred to the collection of the Boston Society of Natural History]; one (?) taken during the winter of 1882-83 at Taunton (Copeland, *teste* Bent, *MS.*); and two seen by Mr. C. S. Phillips at Taunton on December 26, 1885 (Phillips).

Mr. Brewster, in his 'Birds of the Cambridge Region' [1906], has expunged from his records the alleged occurrence in October, 1869, the report of which, he states, was not well based, and he does not include the species in his authentic list. The elimination of this record from the nine leaves but eight records remaining, covering the period 1832 to 1885, more than fifty years. Mr. Brewster, however, places himself on record as regarding the earliest two of these eight records as far from satisfactory on account of their indefiniteness. And I find in his editor's footnote to the species in Minot's 'Land-Birds and Game-Birds of New England,' second edition, published in 1895, this statement: "A very rare and irregular winter visitor from the north. The most interesting instances of its occurrence are those given by Mr. Allen, of eleven specimens shot by Mr. Jillson at Bolton, Mass., in January, 1864, and of a single female taken by Mr. N. Vickary at Lynn, Mass., February 18, 1877. I can find no records of its occurrence anywhere in New England within the past fifteen years." The last two Massachusetts records cited above seem not to have been accepted by or else then unknown to the editor. It may be considered, then, that there have not been more than

six published records of the species within the State, which may be accepted as definite, up to the year 1901, and I have been unable to learn of any subsequent record of its occurrence up to the present time, until these occurrences of 1919 which have been recorded in this paper.

Bohemian Waxwings have appeared in other parts of New England, in this season of 1919. Mr. Forbush has received and transmitted to me the following records for Maine:

Mr. W. H. Waterman, Auburn, saw twenty-three Bohemian Waxwings on January 6. He got within fifteen feet of them. And on February 13 Mr. Waterman saw seven Bohemians on a sumac.

Mrs. Herbert Lombard, Gorham, reports seven Bohemian Waxwings on January 25, and a mixed flock of Cedarbirds and Bohemians, not more than five of the latter, on February 8.

Miss Bertha Brown, of Bangor, reports that a member of the Bangor Bird Club, a lady who is a careful observer, saw five Bohemian Waxwings feeding on sumac bushes under her window which looks out on an old garden, February 16, 17 and 21.

Miss Brown, in a letter to me under date of June 18, furnishes one other and a very late record, namely, that on May 29 of this year at Northport, Maine, on Penobscot Bay, where with her sister she has a summer cottage, they observed in an old apple orchard that sloped down to the shore of the bay, a small flock of waxwings, numbering six or seven birds; that one of these was on a low branch very near them, not more than three or four feet away, which from its size and white patches on its wings, they identified as a Bohemian Waxwing. Miss Brown further states that, being intent on reaching a bird at some distance whose calls they were hearing, they unhappily did not stop to examine the other waxwings of the flock, to determine whether there were other Bohemians, but of the identification of the one bird so closely viewed she is sure; that she returned to the vicinity repeatedly, but did not again see that bird; that two days later, and again four days later, she saw small flocks of Cedar Waxwings, three and five respectively, in the same orchard. So Miss Brown concludes: "Whether my one Bohemian Waxwing was associated with a flock of Cedar Waxwings or whether the whole flock that

I saw on May 29 were Bohemian, six or seven birds, I do not know." It may be stated that Miss Brown's records are not called in question by her fellow Maine ornithologists.

Professor William Patten, of the Department of Biology, Dartmouth College, writes me concerning an observation of Bohemian Waxwing by him at Hanover, New Hampshire, the record of which had been sent to Mr. Forbush by Mr. Franklin McDuffie, a student in the college: "Mr. McDuffie was correct in stating that I had reported seeing two Bohemian Waxwings in Hanover on the date reported by him [January 16, 1919]. The circumstances were as follows: I saw the two birds on the top of a larch tree about fifty yards from the window of my lecture room just before the exercise, so that I could not leave the building. I felt confident they were Bohemians, as I know them well from experience with them in Dakota, but I could not distinguish the color, as they were against a very light sky. There was no doubt about the size and the crest. I called in one of my colleagues with younger eyes, and he agreed with me in regard to the crest. Before we could get the glasses the birds flew away. I was not looking for these birds. I did not know until afterward that they had been reported elsewhere in New England at about that time. I have no doubt in my own mind about their identity, but, as you see, the observation lacks something of absolute certainty in regard to wing coloring and other details. About four or five years ago, in the late fall, I saw four Bohemian Waxwings in my front yard and had the pleasure of watching them for a half hour or so within a few yards, when I could see them with perfect distinctness."

Reports from St. Johnsbury, Woodstock, Burlington, Rutland, and Bennington, Vermont, reveal no records by observers in those sections of the State in the season of 1919. Dr. L. H. Ross, of Bennington, writes me under date of April 27, 1919: "No Bohemian Waxwings have been identified in this vicinity this winter, although I have had several observers on the lookout. I have seen flocks of the Cedar Waxwing several times, but could not detect any Bohemian among them. However, I am somewhat hampered in my observations because my field glasses are still on a U. S. submarine."

Correspondence with Mrs. Alice Hall Walter and Mr. Harry S. Hathaway, of Providence, Rhode Island, results in their declarations that they know of no authentic records for this State either in 1919 or in any previous year. Howe's and Sturtevant's 'Birds of Rhode Island' [1899], with subsequent Supplement, does not include the species.

Mr. John H. Sage, of Portland, Connecticut, writes me: "I wish I could give you later Connecticut records than those already published. I have nothing authentic, although two or three people feel quite sure that they have seen the species in our State since 1913." In 'Birds of Connecticut,' published that year by Mr. Sage and co-authors, three records are given, namely: "February 11, 1875, New Haven, one seen (?) (Smith) [Merriam, Birds of Connecticut]; Merriam [*ibid.*] further records that Dr. Wood, of East Windsor Hill, shot one by accident while shooting into a flock of Cedarbirds (specimen now in Atheneum collection, Hartford); fall, 1899, Torrington, one shot from a flock of Cedarbirds (in possession of Hochstein)." Mr. Sage states, in regard to the date of capture of the Atheneum specimen, "The Dr. Wood specimen has been known to me for more than forty years, and I have often talked with the Doctor about it, but he never could give the exact date of capture. It is a beautiful specimen and is still in fine condition."

To extend the inquiry further as to records of Bohemian Waxwing in New England in past years, published works on Maine, New Hampshire and Vermont, birds have been consulted and representative observers and students now active in these States have been communicated with.

O. W. Knight, in his 'Birds of Maine' [1908], states: "It has been years since there has been any definite report of the occurrence of this species in Maine." He further states, however, for Kennebec County, "given in Hamlin's List, 1865"; for Penobscot County, "occasional specimens have been taken in winter, two or three at the outside, but none have been reported for years"; for Washington County, "rare, some winters occurs in large flocks (Boardman)." Knight, writing to Mr. Forbush under date of December 22, 1909, subsequent to the publication of his 'Birds of Maine,' states: "I have the very best evidence

possible that the Bohemian Waxwings were here last winter. You will find the bulk of our knowledge regarding their occurrence here in the 'Journal of the Maine Ornithological Society' for the current year. So it is needless for me to rewrite it. Additionally, I may say that I secured several photographs of the birds while feeding, and Mr. Winch secured two specimens, a fine adult male and a female, which are now in the University of Maine Museum."

The testimony which Mr. Knight refers to in the winter of 1908-09 is this:

Clarence H. Clark, Lubec. Bohemian Waxwings made their appearance December 6, 1908; remained to January 3. Reappeared February 6, 1909, weather raw and rainy. They "keep up an incessant metallic trill." Number stated as twenty. [March 1909, Journal.]

Ora W. Knight, Bangor. March 9, 1909, Dr. W. H. Simmons, of Bangor, saw "a good-sized flock feeding daily on the fruit of a mountain ash beside a window of his home. The birds had been coming for some time before he paid any especial attention to them." On March 11, Messrs. Knight and Minch visited the locality, "found the flock feeding on rotten crabapples in an orchard, sometimes eating the pulp itself, at other times picking the apple to pieces and eating the seeds. Viewed them within fifteen feet." Mr. Knight states: "It is well on to twenty years ago, when the writer was a high school boy just beginning his scientific career, that the Bohemian Waxwing last visited this locality." [June, 1909, Journal.]

Miss Bertha L. Brown, Bangor, states: "The flock of Bohemian Waxwings, which has been seen about the streets of Bangor since early in February, [the number given in letter of Miss Abbot is fifty], had not left us March 30, 1909. I had not seen them until that date, although I had made many efforts to do so. I discovered a good-sized flock among some apple trees. For a good half hour I watched the birds at close quarters." [June, 1909, Journal.]

And this flight of Bohemian Waxwings was also observed at Grand Manan, New Brunswick, by Allan L. Moses, who testifies: "December 22 [1908] I saw one of the rarest birds that come to

the island, the Bohemian Waxwing. Three specimens have been seen here this winter, and I have two of them in my collection. This is the second record of this bird being taken in the island. The first was taken by my father, John K. Moses. I don't know the exact date, but it was about fifteen years ago." [March, 1909, Journal.]

Miss Harriet Abbot, of Fryeburg, on March 6, 1909, observed a Bohemian Waxwing at Bryant Pond. Her letter is so interesting that I quote it entire. Miss Abbot writes me: "On this date it was a rare opportunity to spend the entire day in the company of the Bohemian Waxwing. He came to his usual place, apple tree, near the house in the village of Bryant Pond, Oxford County. At the time the usual number of birds, tree sparrows, hairy and downy woodpeckers, juncos, redpolls, chickadees, and blue jays were feeding on the piazza, trees, and suet nailed on posts. The smaller birds paid no attention to the Waxwing, and they would all feed at once on the floor of piazza. The jays surrounded him on the apple tree, but he did not stir from his limb till the jays, after much noise and disturbance, left the tree. Mrs. Chase, who had the rare visitor from the middle of February until the second week of April, told me the things I observed on the one day were the same as occurred during all the stay. The Waxwing came to piazza *every* fifteen minutes from 8 A. M. to 5 P. M., eating chiefly crumbs of various kinds, sometimes working on the peanuts and chicken food (a kind of coarse mixed grain), but always returning to the crumbs. Mrs. Chase could go near the bird when he was feeding. The song was a soft, sweet trill, not similar to the Cedar Waxwing. Shortly after the date of March 6, 1909, a friend of mine observed a flock of fifty Bohemian Waxwings in Bangor. The Oxford County date was the first record of the bird's appearance in this part of Maine." Referring to the 1919 migration in response to my inquiries, Miss Abbott further states, under date of April 5, 1919: "We have not had the bird in our part of Oxford County [Fryeburg], neither has it been reported from adjoining counties."

Mr. Edmund P. Brown, of Belfast, Maine, very kindly assisted me in procuring such other Maine records from reliable observers as were obtainable. Mr. Basil Newell, of City Point, informed

Mr. Brown that about March 1, 1909, he saw three Bohemian Waxwings in apple trees near the State House in Augusta and that identification was absolute. Miss Bertha Brown, of Bangor, communicated to Mr. Brown the following record: "The only other record that I have of them [Bohemian Waxwing] was January 8, 1916, when several reliable members of our Bird Club, my sister among them, saw two Bohemian Waxwings in a tree on one of Bangor's residence streets. They watched them for some time and made very sure of the identification. Then, also, I was so unfortunate as not to be on the scene. Indeed, the only time I ever saw the bird in life was in the winter of 1909, when a large flock was about Bangor for over two months, February and March. Then I had several opportunities to observe them well and carefully."

Mr. Arthur H. Norton, curator of the Portland Society of Natural History, writes me that he has but one record, that of a bird seen by him at Westbrook, Maine, April 3, 1914.

Other representative ornithologists of Maine have been communicated with, who have reported that they have had no records of Bohemian Waxwing in their life experience.

Dr. Glover M. Allen, in his 'List of the Birds of New Hampshire,' published in 1903, designates the Bohemian Waxwing as "an extremely rare winter visitant," and states: "There appears at present to be no valid published record for the occurrence of this species in the State, but Dr. W. H. Fox informs me that, in the early part of 1880, O. H. Phillips, a taxidermist, took specimens near Nashua"; and that "Mr. W. E. Cram writes me he has observed it at Hampton Falls on February 17 and 21, 1897."

Mr. Charles F. Scott, of the New Hampshire College, Durham, furnishes two records, kindly transmitted to me by Prof. C. F. Jackson, of the Department of Zoology. The records are: "May 10, 1909, three Bohemian Waxwings seen on the Newmarket road between Newmarket and Durham; these were in the town of Durham"; and "June 2, 1913, one seen on the Newmarket road at about the same spot where those of 1909 were seen." Prof. Jackson regards Mr. Scott as "a thoroughly reliable observer" who "can be depended on for correct classification."

Rev. Manley B. Townsend, of Nashua, secretary of the Audubon Society of New Hampshire, and Mr. Lewis Dexter, of Manchester, have faithfully sought information concerning any occurrences of Bohemian Waxwing in the season of 1919, or in previous years, in the State, but unavailingly. No records have been obtained. The late Mr. Fred B. Spaulding's records at Lancaster have been examined by Mr. Fred H. Kennard, in whose possession they now are, and no record of *B. garrula* was found. Mr. Scott's records of 1909 and 1913 at Durham, and Prof. Patten's records of January 16, 1919, and one in 1914 or 1915, at Hanover, are therefore the only records within our knowledge for New Hampshire, additional to those published by Dr. Allen.

In 'A Preliminary List of the Birds Found in Vermont,' by Dr. George W. Perkins assisted by Clifton D. Howe, M. S. [1901], under the caption *Ampelis garrulus*, Bohemian Waxwing, the statement is made: "Not usually seen; but sometimes, especially in early spring or late fall, flocks appear for a few days."

Several interesting Vermont records since the publication of this 'Preliminary List' have been communicated to me. Dr. Lucretius H. Ross, of Bennington, gives a series of records as follows: "1904, a flock numbering twelve to fifteen remained about Bennington village from March 3 to April 6. This flock was in the trees about the streets and was seen by many observers many times. The birds were not at all timid, and I observed them as close as twenty feet; 1908, on March 24, Mrs. Ross and I observed a flock numbering at least thirty. We saw them in an apple tree apparently eating the frozen fruit. Whether all of this flock were Bohemians I am not sure, but the larger number were. This same flock (I suppose) was seen on April 7 by Charles Hitchcock and identified as Bohemians (Hitchcock is a very reliable observer); 1911, March 27, Bohemian Waxwings ten, with Evening Grosbeaks five, in one flock, were studied by six observers for at least one hour. The birds were in low bushes (barberry) eating the berries; 1915, a flock of Waxwings numbering about fifty, composed of both the Bohemian and Cedar, remained during almost the month of April in a yard where there is a large tangle of barberry bushes. These birds were observed many times low down in the bushes and at close quarters; 1917, a flock of twelve

was observed on February 28." In a later communication under date of April 27, 1919, Dr. Ross states: "No Bohemian Waxwings have been identified in this vicinity this winter, although I have had several observers on the lookout. I have seen flocks of the Cedar Waxwing several times, but could not detect any Bohemians among them."

Miss Inez Addie Howe, botanist and instructor at the Fairbanks Museum of Natural Sciences, St. Johnsbury, writes: "In regard to Bohemian Waxwings I will say that on May 30, 1915, I saw a flock of seven in a cemetery at East St. Johnsbury. The next day, May 31, an observer at Lyndon, a town nine miles north of here, reported a flock of seven, presumably the same individuals." And in a subsequent letter Miss Howe states: "Of my own identification of Bohemian Waxwings on May 30, 1915, I am absolutely sure, and I gave full credence to Miss Walmarth's report on the day following, as she had the same number of individuals that I saw on the previous day. My record of May 30, 1915, was accepted by Prof. Wells W. Cooke, then of the U. S. Biological Survey, and it is on their files in Washington. I shall be glad to have you use my date in your paper and shall be willing to answer any questions or criticisms that it may occasion. I am sufficiently familiar with both species of Waxwings in our collections here, so that I feel sure of either wherever or whenever they may appear." In a letter of still later date, May 8, 1919, Miss Howe writes, "The one date of May 30, 1915, is my only one for Bohemian Waxwings in the twenty-five years that I have carefully observed the birds in this section."

I am also informed by Miss Howe that Mr. W. E. Balch, taxidermist of the Fairbanks Museum, and formerly of Lunenburg, testifies that he saw a flock of seven Bohemian Waxwings in an apple orchard in Lunenburg in February a few years ago. Mr. Balch's lamented illness throughout the winter and spring and recent decease prevent ascertaining what the year was.

Mr. George L. Kirk, of Rutland, writes: "Although I have been engaged in bird observations here for twenty years, I cannot positively say that I have seen a Bohemian Waxwing in Vermont. Some half dozen years ago, while on Mount Killington in mid-February with L. H. Ross, of this city, we saw a small group of

waxwings in the forest at about 3000 feet altitude. I should hardly expect Cedarbirds at such a place at that season, the weather being below zero and the snow deep, but unfortunately we had no glass and were unable to shoot one of the birds."

Mr. Charles F. Scott, of Durham, through Prof. C. F. Jackson, of the Zoology Department of the New Hampshire College, furnishes a record of a flock of about eighty Bohemian Waxwings seen on Killington Mountain below the summit, elevation about thirty-two hundred feet, on September 8, 1913. This seemed so extraordinary a record for its earliness that I wrote Mr. Scott to learn more particularly concerning this occurrence. Mr. Scott's interesting letter in reply would seem to leave no doubt as to the correctness of his identification. He writes: "It is true, as you have stated, that that species should not be found in our latitude in September. However, the bird is quite a wanderer and is often seen where least expected. In respect to the data I have in regard to the Killington Mountain record I would say that there could be no possible question of the identification, as I was able to get very close to the birds and observe all the marks of identification, including all those which you mention. I was very much surprised to find the species there at that time. I am, however, familiar with the bird in the north where also I have records, and from the experience I have had it would be impossible for me to confuse it with the Cedar Waxwing. * * * I observe not only all the identification marks, but also all habits, notes, and make especial note of the flight. * * * I certainly should not regard size alone as being enough to always distinguish the Bohemian from the Cedar Waxwing. You will also find a difference in flight and note. On the Killington Mountain trip the notes of several of the birds were heard. I had been told before by natives of the Green Mountains of the occurrence of the Bohemian Waxwing in the Green Mountains at that time of the year. It has also been reported in early October from the Mt. Mansfield-Camel's Hump region in the towns of Stowe and Duxburg. However, I cannot vouch for that. The best place to observe the habits of the Bohemian Waxwing is in Northern Quebec, north of Lake St. John. Another good region is in Northern Ontario along the line of the Canadian Government railways. In these two regions quite large flocks are seen in the Fall."

Mrs. Elizabeth B. Davenport, in an article on 'Birds of Windham and Bennington Counties' in 'Bulletin No. 2' of the Vermont Bird Club, July, 1907, includes Bohemian Waxwing, with the statement: "Reported from Bennington County. I identified one flock in Brattleboro, April, 1901." And in the joint 'Bulletins,' 4 and 5, of the Vermont Botanical and Bird Clubs, 1919, page 29, there is a record of a flock of Bohemian Waxwings numbering one hundred or more at "Sky Farm," Hartland, on October 30, 1917, observed by Miss Nancy Darling and her sister, Mrs. A. B. Morgan. Moreover, Miss Darling states that some years previously a flock of half a dozen or so visited the farm.

These Vermont records indicate that the Bohemian Waxwing reaches Vermont from time to time to a greater extent than it does New Hampshire, Maine, and Massachusetts, entering the State from the northwest on its long southeastward migration and sometimes scarcely penetrating New England further. The absence of Rhode Island records and the few records of Connecticut further indicate the southern bounds of the migration of the species into New England.

The records of 1919 and of recent years throughout northern and central New England, which have been presented, suggest that the Bohemian Waxwing, like the Evening Grosbeak, may have become a less unusual visitant than in former years, when our eminent ornithologists were active in the field, and very rarely, if at all in their life-long experience, was a specimen seen or taken by them. The range of date of occurrence extends, upon what seems to be reliable testimony, from surprisingly early dates, namely: September 8, Killington Mountain, Vermont, and October 30, Hartland, Vermont, to surprisingly late dates, namely: April 27, Malden, Mass.; May 29, Northport, Maine; May 30, St. Johnsbury, Vermont; and May 10 and June 2, Durham, New Hampshire; while the more usual season of occurrence is January to March inclusive, sometimes extending into April.

To summarize the records subsequent to 1900, given in this paper, the numbers in parentheses representing the respective number of individuals observed, and unless otherwise designated the time of occurrence being within the period of January to April inclusive, we have: *Grand Manan, N. B.* (3), Dec. 22, 1908.

Maine, Lubec (20), Dec. 6, 1908-Feb., 1909; Bangor (50), 1909; Augusta (3), 1909; Bryant Pond (1), 1909; Westbrook (1), 1914; Bangor (2), 1916; (5), 1919; Northport (1), May 20, 1919; Auburn (23, 7), 1919; Gorham (7, 5), 1919. *New Hampshire*, Durham (3), May 10, 1909; (1), June 2, 1913; Hanover (4), 1914 or 1915; (2), 1919. *Vermont*, Brattleboro (flock), 1901; Bennington (12-15), 1904; (nearly 30), 1908; (10), 1911; (some in a mixed flock of 50), 1915; (12), 1917; Hartland (5), late fall, 1908; (100), Oct. 30-31, 1917; Mount Killington (80), Sept. 8, 1913; (small flock), Feb., 1914 (?); Lunenburg (7), a few years ago; St. Johnsbury (7), May 30, 1915; no records for 1919. *Massachusetts*, all in 1919, Boston, Chestnut Hill district (1); Roslindale district (5); Newton Highlands (1); Malden (1); Essex (1); Greenfield (2); South Deerfield (2); West Stockbridge (8-10). *Rhode Island*, none. *Connecticut*, none.

The more notable incursions have been, therefore, in 1909, beginning in December, 1908, when reports from four localities in Maine and one from Grand Manan, N. B., include 77 individuals; and from one locality in New Hampshire, three individuals; and a second incursion in 1919, when reports from four localities in Maine include 36 individuals, from one locality in New Hampshire, two individuals, and from eight localities in Massachusetts, 21 individuals. In neither of these farther incursions into New England, strange to say, does a Vermont record appear. Yet in that State there are twelve records in nine or ten other years from six different localities, aggregating 300 individuals, more or less; while in these other years Maine furnishes but one record each in 1914 and 1916, New Hampshire but one record each in 1913 and 1914 (or 1915 ?), and Massachusetts, none at all. Vermont in the size of flocks observed far exceeds Maine, New Hampshire, and Massachusetts.

Bohemian Waxwings again appeared in New England in the late winter of 1920. Mr. E. P. Brown, of Belfast, Maine, reports that two male birds were seen by Mrs. Brown on January 26, with twenty Pine Grosbeaks, in a yard adjoining theirs. A neighbor reported having seen four or five Bohemians on the day preceding. February 1, eight individuals were seen by Mrs. Brown; three or four were in the full plumage of the male. This flock

continued to be observed from time to time up to February 29. On one occasion a pair was observed "billing," as do the Cedar Waxwings. Mr. Brown further states: "We noted that while Pine Grosbeaks or Evening Grosbeaks were usually present with them, they did not intermingle, the Bohemians keeping in a quite compact flock even when perching and feeding. Their whole diet while with us seemed to be the pulp, perhaps sometimes the seeds, of frozen apples. They seemed to show a preference for crabapples, and I am certain they commonly ate the pulp and showed no impatience to get at the seeds. They did not take alarm early, but had the habit, common with Cedarbirds, of simultaneous flight from no apparent cause."

Miss Bertha L. Brown, of Bangor, Maine, under date of March 3, 1920, writes: "A small flock of five or six Bohemian Waxwings are here in Bangor now; first seen on February 23, when they came to crabapple trees in a friend's yard. * * * I am sure there were five of them, and I think six. They did not mingle with the Pine and Evening Grosbeaks that were numerous in other parts of the tree, but kept aloof by themselves near the top of the tree. There, on March 1, they stayed for hours. The birds were displaying all their interesting and ingratiating mannerisms, frequently billing or caressing each other."

The Bohemian Waxwing again reached Massachusetts in the winter of 1919-20. One local record is at hand. Mrs. Edmund Bridge informed me that two or more Bohemians were present in West Medford from February 28 to March 3, with a flock of about forty Cedar Waxwings. Twelve Evening Grosbeaks, of which six were full plumaged males, and nine Pine Grosbeaks were near companions, a similar association of species as observed in Maine.

NOTES ON NORTH AMERICAN BIRDS.

X.

BY HARRY C. OBERHOLSER.

IN further continuation of the writer's comments on various North American birds,¹ the following data are offered. These concern four species, belonging to the families Colymbidae, Ardeidae, Megalornithidae, and Scolopacidae.

***Colymbus holböllii* (Reinhardt).**

Holboell's Grebe has for a long time been considered a distinct species. It does not, however, need much study to show that it is but a geographic race of the European and west Asian *Colymbus grisegena* Boddaert,² with which it is identical in color, and from which it differs only in larger size, especially of the bill. Furthermore, this difference of size is only average, since the extremes of all measurements overlap.

The earliest name applied to Holboell's Grebe is *Podiceps rubricollis major* Temminck & Schlegel,³ since the representatives of this species from eastern Asia are the same as those of North America; but so long as the bird remains in the genus *Colymbus* this name of Temminck and Schlegel's is preoccupied by *Colymbus major* Boddaert,⁴ which is now *Aechmophorus major* (Boddaert). Now, however, since this grebe must be removed to the genus *Pedetaithya* Kaup, this name becomes tenable and has priority over *Podiceps holböllii* Reinhardt.⁵ Holboell's Grebe should, therefore, now be known as *Pedetaithya grisegena major* (Temminck and Schlegel).

¹ For previous papers in this series, cf. 'The Auk,' XXXIV, April, 1917, pp. 191-196; XXXIV, July, 1917, pp. 321-329; XXXIV, October, 1917, pp. 465-470; XXXV, January, 1918, pp. 62-65; XXXV, April, 1918, pp. 185-187; XXXV, October, 1918, pp. 463-467; XXXVI, January, 1919, pp. 81-85; XXXVI, July, 1919, pp. 406-408; XXXVI, October, 1919, pp. 556-559.

² Tabl. Planch. Enlum. d'Hist. Nat., 1783, p. 55.

³ Fauna Japonica, 1842, p. 122, pl. 78 B (Japan).

⁴ Tabl. Planch. Enlum. d'Hist. Nat., 1783, p. 24.

⁵ *Podiceps Holböllii* Reinhardt, Videnskab. Meddelelser Naturh. For. Kjobenhavn, 1853, Nos. 3-4 (1854), p. 76 (Nenortalik, Julianehaab Dist., Greenland).

***Botaurus lentiginosus* (Montagu).**

The bittern known as *Botaurus lentiginosus*, although the North American representative of the European *Botaurus stellaris*, is a very different bird. It has, however, recently been considered by Dr. Ernst Hartert¹ a subspecies of the latter. It differs conspicuously from *Botaurus stellaris* in the possession of a broad black stripe down the side of the neck, which is represented in *Botaurus stellaris* by only a short rictal stripe of brown or blackish; in the much duller, more uniform upper surface, which is dark brown finely mottled with buffy and ochraceous, instead of, as in *Botaurus stellaris*, black with large, bold, strongly contrasted, bars and streaks of buffy and ochraceous; and particularly in the lack of tawny bars on the primaries, secondaries, and primary coverts, which parts are plain brown, or, at most, with tawny mottlings on the terminal portion. Examination of a series shows that all three of the above characters are constant in every individual and show no indication of the intergradation necessary to reduce *Botaurus lentiginosus* to subspecific rank. Occasional immature specimens of *Botaurus stellaris* have few or no tawny bars on the primaries and secondaries, but this, of course, unless it occurs in adult examples, can not be regarded as evidence of intergradation. There are other differences between *Botaurus lentiginosus* and *Botaurus stellaris*, such as the paler, much more brownish (less blackish) pileum, and the broader, more uniform character of the streaks on the anterior lower parts, but since these differences are not entirely constant they are not of particular interest in the present connection.

In view of the above facts, *Botaurus lentiginosus* is best regarded as a distinct species; and it should thus stand as it has stood in the writings of almost all authorities from the time of its description. Its name, therefore, should continue to be *Botaurus lentiginosus*.

***Grus mexicana* (Müller).**

The Little Brown Crane (*Grus canadensis*)² differs from the Sandhill Crane (*Grus mexicana*)³ only in smaller size, particularly

¹ Hand-List Brit. Birds, 1912, p. 126.

² *Ardea canadensis* Linnaeus, Syst. Nat., ed. 10, I, 1758, p. 141 (Hudson Bay, Canada).

³ *Ardea mexicana* Müller, Natursyst. Suppl., 1776, p. 110 (Mexico).

of the bill. This difference has for a long time been supposed to be so trenchant that no intergradation between the two forms was indicated, and therefore they have been regarded as distinct species. In the course of many years the writer has examined and measured a large number of these birds, and the results obtained show that while typical specimens, and in fact the majority, are readily assignable to one form or the other, the measurements of wing, tail, tarsus, and even bill completely inosculate, and that, therefore, specific distinction cannot be maintained. This view agrees with that of the most recent monographer of the family Gruidae,¹ who considered *Grus mexicana* a subspecies of *Grus canadensis*; while more recently Mr. W. E. C. Todd has conclusively shown² that *Grus nesiotes* Bangs and Zappey³ is but subspecifically distinguishable from *Grus mexicana*.

It may be worth while again to call attention to the undesirability of further continuing the use of the generic name *Grus* Pallas for the cranes, although perhaps sufficient publicity has been given to the matter by Allen,⁴ Mathews,⁵ and Hartert.⁶ The generic name *Grus*, commonly used for the typical cranes, was first proposed by Pallas, in his 'Miscellanea Zoologica,' 1766, p. 66; but here the only species included is *Psophia crepitans*. This latter species becomes, therefore, by monotypy, the type of *Grus*, and *Grus* is, consequently, a synonym of *Psophia*. The only other available name for the cranes is *Megalornis* Gray,⁷ the type of which is, by monotypy, *Ardea grus* Linnaeus.

In view of this and of the fact that the Whooping Crane, commonly called *Grus americana* (Linnaeus) belongs in a separate genus, *Limnogeranus* Sharpe, the American representatives of the genus *Grus*, or, as it should now be, *Megalornis*, will stand as follows:

¹ Brasil, *Genera Avium*, No. XIX, 1913, p. 4.

² *Annals Carnegie Mus.*, X, Nos. 1-2, January, 1916, pp. 205-208.

³ *Amer. Nat.*, XXXIX, No. 4, April, 1905, p. 193 (La Vega, Isle of Pines, Cuba).

⁴ *Bull. Amer. Mus. Nat. Hist.*, XXIII, 1907, p. 313.

⁵ *Novit. Zool.*, XVII, No. 3, December 15, 1910, p. 502.

⁶ Hartert, Jourdain, Ticehurst, and Witherby, *Hand-List British Birds*, 1912, p. 210.

⁷ *List Genera and Subgenera of Birds*, 1841, p. 85.

Megalornis canadensis canadensis (Linnaeus).

Megalornis canadensis mexicana (Müller).

Megalornis canadensis nesiotus (Bangs and Zappey).

***Gallinago gallinago delicata* (Ord).**

Although *Gallinago delicata* has been commonly considered a distinct species, several authors have treated it as a race of the Old World *Gallinago gallinago*. Among the most recent of these is Dr. Hartert.¹

The American bird differs from *Gallinago gallinago* chiefly in the possession of 16 instead of 14 rectrices; in having the under wing-coverts much less extensively white, and usually with heavy bars of dusky brown; the axillars regularly and broadly barred with dark brown instead of being almost pure white or only spotted with dusky; and in having the outer pair of rectrices narrower. A recent investigation of all these characters furnishes the following results: the number of tail-feathers in *Gallinago delicata*, although usually 16, is sometimes only 14, while in *Gallinago gallinago*, although usually 14, is not infrequently 16. The under wing-coverts in *Gallinago gallinago* are sometimes as strongly barred with dark brown as in the American bird, although apparently in the latter they never become as nearly pure white as in the European bird. The same remark will apply to the axillars in the two birds. The outer pair of rectrices, though usually broader in *Gallinago gallinago*, is sometimes fully as narrow as in specimens of *Gallinago delicata*. In all these characters *Gallinago delicata* seems to be more stable than *Gallinago gallinago*, lending interest to the suggestion that the latter is a more recent evolution from *Gallinago delicata*. There seems to be, however, from the above discussion no doubt of the propriety of considering *Gallinago delicata* a subspecies of *Gallinago gallinago*, since the latter was the first one described and since there is no single constant character separating the two. The American bird, therefore, should henceforth be known as *Gallinago gallinago delicata* (Ord).

¹ Hand-List British Birds, 1912, p. 190.

THE GEOGRAPHIC RACES OF *CYANOCITTA CRISTATA*.

BY HARRY C. OBERHOLSER.

As currently accepted the range of *Cyanocitta cristata florincola* is confined to Florida. Study of material in the United States National Museum, including the Biological Survey collection, recently acquired from the southeastern United States, has led, however, to the conclusion that the limits of the geographical distribution of this race must be very greatly extended. This extension includes South Carolina, the type locality of *Cyanocitta cristata cristata* (Linnaeus), and thus involves a readjustment of both forms of the species. These changes in distribution and nomenclature are explained in the following paragraphs:

Cyanocitta cristata cristata (Linnaeus).

Corvus cristatus LINNAEUS, Syst. Nat., ed. 10, I, 1758, p. 106 ("America septentrionali") (based on *Pica glandaria caerulea cristata* Catesby, Nat. Hist. Carolina, Fla., and Bahama Is., I, 1753, p. 15, pl. 15).

Cyanocitta cristata COUES, Key North Amer. Birds, ed. 2, 1884, p. 421 ("Florida" [type from Hibernia, Clay Co., Florida]).

Cyanocitta cristata florincola AUCT.

Chars. Subsp.—Size small; blue of upper parts decidedly purplish; white tips of greater wing-coverts, tertials, secondaries, and rectrices, small.

Measurements.—Male:¹ wing, 119.5–135 (average, 126) mm.; tail, 114.5–126.5 (120); exposed culmen, 23–26 (24.5); tarsus, 32.5–35 (33.5); middle toe without claw, 18–23 (20).

Female:² wing, 117.5–127 (average, 122.5) mm.; tail, 108.5–117.5 (113.5); exposed culmen, 23–25.4 (24.5); tarsus, 32–34.5 (33.5); middle toe without claw, 17.5–19.5 (18.8).

Type locality.—Southeastern South Carolina.³

Geographic distribution.—Resident in the southeastern United States, north to central North Carolina, northwestern South Carolina, northern Alabama, southwestern Indiana, southern Illinois, southeastern Missouri, central Arkansas, northeastern and central Texas; west to southwestern Arkansas and central Texas; south to the coast of the Gulf of Mexico from southeastern Texas to the southern part of the Florida peninsula; east to the Atlantic coast from southern Florida to North Carolina.

¹ Eleven specimens, from Florida.

² Nine specimens, from Florida.

³ Here for the first time thus definitely designated.

Remarks.—The characteristics of this race are very constant in Florida birds, but become less so in those from farther north. There is apparently little, if any, migratory movement in this subspecies, so that its occurrence in any locality is fairly good evidence of its breeding there. Specimens from Christ Church Parish in southeastern South Carolina are in color like those from Florida, though barely darker and less purplish above, and with the white tips of the wing-feathers slightly larger. Birds from Kershaw County in the north central part of the same State are practically the same as those from Florida. Examples from southern Alabama, southern Mississippi, and southern Louisiana are similar to Florida birds, but are somewhat larger and have rather more extensive white markings on wings and tail. Breeding birds from Raleigh, North Carolina, and from extreme northern Alabama are intermediate between *Cyanocitta cristata cristata* and the form of the species inhabiting the northeastern part of the United States, but are nearer the former. A large series of Blue Jays from the lower Wabash valley in southwestern Indiana and southeastern Illinois shows conclusively that breeding birds of this region must be referred to *Cyanocitta cristata cristata*. They are, in general size, in width of the white wing-bars, and in the white tips of the wing-quills, very close to this race, although in the amount of white on the tips of the rectrices, as well as in the color of the upper parts they approach closely to the northern race. The following average measurements of specimens from southeastern Illinois and southwestern Indiana show how near the Florida race in size the birds from this region are:

Male:¹ wing, 130 mm.; tail, 127.5; exposed culmen, 25.2; tarsus, 34.5; middle toe without claw, 20.5.

Female:² wing, 125 mm.; tail, 119.5; exposed culmen, 23.5; tarsus, 34.5; middle toe without claw, 20.5.

In this connection it is of interest to note that Mr. Robert Ridgway, so he informs me, has recently come to the same conclusion regarding the subspecific identity of these southern Illinois and Indiana breeding birds.

The well-known Blue Jay was first given a technical designation by Linnaeus,³ who based his name entirely on the figure and description given by Catesby.⁴ Although Catesby gives no specific locality for the species, the well-known fact that Catesby's work was done largely in the vicinity of the Savannah River in southeastern South Carolina has led to the selection of "Carolina" as the type locality.⁵ An examination of Catesby's figure and description leaves no doubt at all that both refer to the small purplish blue race with narrow white wing and tail edgings, which is found in the southeastern United States and which was sub-

¹ Nine specimens.

² Five specimens.

³ *Corvus cristatus* Linnaeus, Syst. Nat., ed. 10, I, 1758, p. 106.

⁴ Nat. Hist. Carolina, Fla., and Bahama Is., I, 1753, p. 15, pl. 15.

⁵ American Ornithologists' Union Committee, Check-List North Amer. Birds. 1910, p. 222.

sequently named *Cyanocitta cristata florincola* by Dr. Elliott Coues.¹ This discovery necessitates, of course, the transference of the name *Cyanocitta cristata cristata* to the Florida bird and the relegation of *Cyanocitta cristata florincola* Coues to synonymy. Furthermore, it now seems worth while still more definitely to designate the type locality as southeastern South Carolina.

Since there are no other names to complicate the situation, the common Blue Jay of the northeastern United States needs a new designation.

The 215 specimens of this race examined in the present connection are from the following localities:

Alabama.—Barachias (March 8 and 9, 1913); Spring Hill (May 8 and 11, 1911); Mobile Bay (April 29, 1892); Perdido Bay (Sept. 13, 1911); Catherine (April 14, 1894); Autaugaville (Feb. 29, 1912; Sept. 17, 1911); Leighton (July 2, 1913; April 22, 23. and 24, 1914; March 30, 1912); Mobile (April 20, 1915); Guntersville (June 17, 1913); Choccolocco Mountain (June 10, 1913); Hayneville (July 22, 23, 24, 26, and 28, 1915); Sand Mountain (June 25 and 27, 1913; April 16, 1914); Huntsville (May 13, 1912); Teasley's Mill (May 13, 1914); Mussel Shoals (March 18, 1915); Elkmont (July 15, 1913); Auburn (March 4 and 6, 1912); Wilsonville (June 3 and 4, 1913).

Arkansas.—Delight (July 17, 1912).

Florida.—Braden River (June 11, 1918); Lake Worth (May 6, 1889); Mico (Jan. 25, 1895); Fort Bassinger (Feb. 7, 10, 17, 22, and 26, 1896; March 3 and 4, 1896); Fort Thompson (Feb. 28, 1898; March 3, 1898); Driggs Landing, Kissimmee River (March 2, 1895); Kissimmee (Jan. 26 and 30, 1901; Feb. 2, 1901); Lake Kissimmee (March 21, 1901); Fort Gardner, Kissimmee River (Feb. 28, 1901; March 9, 1901); Moses Creek (May 17, 1894); five miles west of Miami (March 1, 1895); two miles west of Miami (Nov. 24, 25, and 26, 1904; Dec. 15, 1904); Mullet Lake (Nov. 23, 1895); Fort Meade (June 29, 1879); Tallahassee (Jan. 24, 1903; Feb. 18, 1903); Welaka (Dec. 26 and 28, 1885); Lake Arbuckle, Polk County (March 7, 1895); Lake Hatch-ne-haw (Feb. 12, 1901); San Mateo (1892); Hibernia (Feb. —, 1870); Miami River (March 18, 1859); Bayport (Feb. 26, 1877); Pellicier's Creek (May 20, 1894); Milton (March 25, 1881); Orange Hammock (March 2 and 3, 1895); Enterprise (March 10, 1869); Lake Trafford (Feb. 1, 1898); Shell Hammock (Feb. 14, 1901).

Georgia.—Floyd's Island, Okefinokee Swamp (Jan. 4, 1917); Red Hill (June 1, 1916); Liberty County (1845).

Illinois.—Olney, Richland County (April 16, 18, 21, 22, 23, 27, and 29, 1914; April 11 and 12, 1917; May 6 and 8, 1914; May 2 and 12, 1917; Jan. 13, 1917; Jan. 12, 14, 15, 18, 19, 22 and 28, 1918; Dec. 15 and 17, 1917; Dec. 19, 1916); Sugar Creek Prairie, Richland County (June 2, 4, 5, and 6, 1890); Mount Carmel (April 29, 1869; April 17, 1878; Oct. 22, —); Wabash County (Oct. 4, 1879).

¹ Key North Amer. Birds, ed. 2, 1884, p. 421 (Florida).

Indiana.—Knox County (April 21, 1881; May 5, 1881); Wheatland (May 5, 1885; May 10, 1890; May 5, 1883).

Louisiana.—Belcher (Feb. 3, 4, and 5, 1908); Bayou Tunica (March 16, 1884); Iowa Station (April 18, 1899).

Mississippi.—Magee (July 12, 1912); Adams Station (Oct. 22, 1912); Duckhill (May 24, 1912); Bay St. Louis (April 28 and 29, 1892); Washington (May 20, 23, and 24, 1892).

North Carolina.—Raleigh (Oct. 28, 1891).

South Carolina.—Blacksburg (June 22, 1916; Easley (June 13, 1916; Christ Church Parish (May 11 and 16, 1911; April 28, 1911); Wayne's Place, Christ Church Parish (May 3, 5, and 10, 1911); Aiken (March 15, 1873); Kershaw County (Feb. 4, 1904; March 17, 1904; Jan. 22, 1904; Dec. 28 and 29, 1903).

Texas.—Dickinson Bayou, opposite Galveston (March 20, 22, and 24, 1892).

***Cyanocitta cristata bromia*, nom. nov.**

Cyanocitta cristata cristata Auct. nec Linnaeus.

Chars. subsp.—Similar to *Cyanocitta cristata cristata*, but larger; upper surface decidedly more bluish (less purplish); white tips of greater coverts, tertials, secondaries, and rectrices, larger.

Description.—Type, adult male, Wooster, Wayne County, Ohio; October 18, 1892; Harry C. Oberholser, original number, 767. Crown and occipital crest blue, between flax flower blue and grayish blue violet (2),¹ the anterior part of crown with whitish flecks; nasal plumes light blue, with black tips and shafts; forehead, lores, and a rather narrow collar around the entire neck, black; behind this a cervical collar of blue like the crown, reaching around to the sides of the neck; back, scapulars, and sides of neck posterior to the blue collar, between dark plumbago blue and deep aniline lilac; rump and upper tail-coverts, light tyrian blue, verging toward squill blue, the longest upper tail-coverts duller and more greenish; tail blue, varying from brownish porcelain blue on the bases of the middle feathers and gobelin blue on the basal portions of the remaining rectrices, to dark orient blue distally, the inner margins of all but the middle pair basally dark mouse gray; middle tail-feathers regularly and numerous barred with black; the remaining rectrices also thus barred on their outer webs except basally, these bars gradually decreasing toward the outermost pair of rectrices, which are entirely without such markings; all but the middle pair of tail-feathers broadly tipped with white, these areas being 16 mm. long on the inner feathers to about 34 mm. on the outermost; wing-quills dark mouse gray, their inner margins somewhat lighter and more brownish, the tips of the primaries washed with

¹ The names of colors are from Mr. Ridgway's "Color Standards and Color Nomenclature."

deep orient blue, the outer edges of the primaries deep Alice blue, but their terminal portions only washed with this color; tertials and outer margins of the secondaries between indigo blue and Hortense blue; but the middle part of the outer webs of the tertials pale blue, and all but the outer webs of both tertials and secondaries broadly barred with black; primary coverts similar to the outer margins of the secondaries, but duller and darker, and also barred with black; greater coverts partly China blue, partly between indigo blue and Hortense blue, and barred with black; median and lesser coverts like the back; greater coverts broadly, the tertials and secondaries very widely, tipped with white; superciliary stripe, cheeks, auriculars, together with chin and throat anterior to the black collar, pale grayish white washed with purplish blue; breast and sides of breast, light drab, washed with pale purplish blue; sides and flanks drab gray; the rest of the lower parts dull white; lining of wing fuscous black; axillars and edge of wing washed with dull blue; "iris dark brown; bill and feet black."

Measurements.—*Type*: total length (in flesh), 304 mm.; extent, 450; wing, 143; tail, 135; exposed culmen, 27; tarsus, 35.5; middle toe without claw, 21.5.

Male:¹ wing, 132.5–148 (average, 139.8) mm.; tail, 122–147.5 (133.5); exposed culmen, 23–30 (27); tarsus, 35.5–37 (36.3); middle toe without claw, 20.5–23.5 (21).

Female:² wing, 128.3–139 (average, 132) mm.; tail, 122.5–130 (127); exposed culmen, 23–26.5 (24.3); tarsus, 31.8–36 (33.8); middle toe without claw, 18.5–21 (19.5).

Type locality.—Wooster, Wayne County, Ohio.

Geographic distribution.—Northeastern United States and southern Canada. Breeds north to Newfoundland, the valley of the St. Lawrence River, northern Ontario, and northern Alberta; west to central Alberta, western North Dakota, western South Dakota, eastern Colorado, and northwestern Texas; south to central northern Texas, central Missouri, central Illinois, central Indiana, central eastern Tennessee, northwestern North Carolina, and Virginia; east to the Atlantic coast from Virginia to Newfoundland. Casual at Fort Churchill, Manitoba, and Fruitland, New Mexico. More or less migratory in the northern part of its range, and occurring in winter in southern Illinois.

Remarks.—As already explained, the common eastern Blue Jay proves to be nameless by reason of the transfer of its current subspecific name to the southern race of the species. Specimens from Maryland, the District of Columbia, and northern Virginia are in color like the northern form, and only in their slightly smaller size do they indicate vergence toward *Cyanocitta cristata cristata*, and they, therefore, are clearly refer-

¹Ten specimens, from Ontario, Saskatchewan, Manitoba, North Dakota, Minnesota, New York, Pennsylvania, and Illinois.

²Seven specimens, from Minnesota, Massachusetts, New York, and Pennsylvania.

able to *Cyanocitta cristata bromia*. Examples from central northern and northwestern Texas, as well as from central Oklahoma, are, however, decidedly intermediate, but belong apparently to this northern subspecies. Although the breeding birds and a majority of the winter birds of a large series from Olney, Illinois, are *Cyanocitta cristata cristata*, there are six individuals which are so typical of *Cyanocitta cristata bromia* that they apparently indicate a southwestern movement of the latter during the winter season.

The 106 specimens of *Cyanocitta cristata bromia* examined came from the localities given below:

Manitoba.—Red River.

Nova Scotia.—Halifax.

Ontario.—Lorne Park, Peel County (March 5, 1888); Lake of Bays (July 19, 1911).

Saskatchewan.—St. Louis (Sept. 12, 1897).

District of Columbia.—Washington (May 5, 1893; Nov. 26, 1910; Oct. 5, 1891; Sept. 19, 1911); Anacostia River (April 30, 1893); Rock Creek (May 7, —; May 5, 1875).

Illinois.—Cook County (Dec. 6, 1869); Olney¹ (Dec. 20, 1916; Jan. 14, 1918; Dec. 15 and 17, 1917; Oct. 14, 1913; Jan. 18, 1917).

Kansas.—Cairo (Aug. 4, 1892); Fort Leavenworth (June 3, 1859); Belle Plaine (July 26, 1892).

Maryland.—Laurel (Sept. 19, 26, and 27, 1889); May 30, 1882; May 6 and 13, 1889; May 12, 1888); Grantsville (June 26, 1899); Sandy Springs (Feb. 1, 1891); Tacoma Park (Oct. 18, 1889); Great Falls (Sept. 27, 1889); Garrett Park (June 25, 1893); Aikin (Dec. 14, 1893); Bittinger (June 28, 1899); Branchville (Jan. 19, 1893); Finzel (June 17, 1899); eastern bank of Susquehanna River (March 2, 1894).

Massachusetts.—West Newton (March 9, 1894); Lincoln (April 10, 1896); Amherst (May 12, 1886); Cambridge.

Minnesota.—Fort Snelling (Jan. 2, 1903; March 7, 1903; March 26, 1890; Nov. 11, 1890; Dec. 13, 1890).

New Mexico.—Fruitland (Oct. 17, 1908).

New York.—Syracuse (May 7, 1887); Highland Falls (Oct. 2 and 4, 1882; Sept. 29, 1896; May 17, 1883; Nov. 30, 1878); Catskill Mountains (Sept. 21, 1896).

North Carolina.—Roan Mountain (July 11, 1895).

North Dakota.—Fairmount (May 24, 1915); Oakdale (June 30, 1913; July 1, 1913); Tokio (July 2, 1915); Pembina (June 2, 1873).

Ohio.—Wooster (Oct. 7 and 18, 1892; Oct. 3 and 21, 1890; Nov. 26, 1891; Dec. 25, 1890; Jan. 22, 1891; March 25, 1892).

Oklahoma.—Mount Scott (April 28, 1904).

Pennsylvania.—Carlisle (April 30, 1844; May 2, 1844); Red Bank (June 16, 1894); Leasuresville (June 29, 1897).

¹ Not breeding.

Rhode Island.—Lake Worden (Nov. 25, 1900; Dec. 11, 13, and 20, 1900).

Texas.—Lipscomb (June 22 and 24, 1903); Vernon (April 28, 1894); Henrietta (April 21, 1894).

Virginia.—Fairfax County (Nov. 25, 1880); Falls Church, Fairfax County (Nov. 27, 1890); McRaes (Oct. 24, 1890); Gainesville (May 17, 1887).

West Virginia.—Franklin (June 26, 1899); White Sulphur Springs (April 29, 1893).

Wisconsin.—Palmyra (June 23, 1890); Marquette (Oct. 25, 1908); Kenosha (Oct. 11, 1888); Delavan (Oct. 23, 1910).

THIRTY-EIGHTH STATED MEETING OF THE AMERICAN ORNITHOLOGISTS' UNION.¹

BY T. S. PALMER.

THE Thirty-eighth Stated Meeting of the American Ornithologists' Union¹ was held in Washington, D. C., November 8 to 11, 1920. The business sessions on the opening day were held at the Cosmos Club and the public sessions on the following days at the United States National Museum. The meeting was one of the most largely attended in recent years, and with the excursions on Friday and Saturday occupied the entire week.

Attendance.—The total attendance of Fellows, Members, Associates and visitors was nearly 150. The Fellows present numbered 25 and the Retired Fellows two. Among these were two of the nine surviving founders, Dr. A. K. Fisher and Dr. R. W. Shufeldt, and eleven members elected at the first meeting in

¹ This was the eleventh meeting held in Washington, D. C. Readers who have access to early volumes of 'The Auk' will be interested in comparing the report of the first Washington meeting in 1886, given in Vol. IV, pp. 56-61. The Union then had 252 members, of whom about 20 Active Members (now known as Fellows) and 13 Associates were present. Five additional Corresponding Members and 44 Associates were elected. Committees were appointed to draft a new Constitution and By-laws, and to take the necessary steps to incorporate the Union. The recent publication of the first 'Code and Check-List' had caused a deficit which it was necessary to meet. The economic relations of birds caused considerable discussion in connection with the presentation of extended reports of the Committees on Protection and on Geographical Distribution of North American Birds. The work originally undertaken by these Committees subsequently developed to such an extent that it resulted in the organization of the National Association of Audubon Societies and the U. S. Biological Survey.

1883: seven Fellows, Prof. W. B. Barrows, Ruthven Deane, Dr. Jonathan Dwight, Dr. George Bird Grinnell, Dr. T. S. Roberts, John H. Sage, and W. E. Saunders; two Retired Fellows, H. W. Henshaw and Dr. Leonhard Stejneger; one Member, Dr. F. H. Knowlton; and one Associate, Dr. W. H. Fox. Among others present were Dr. Frank M. Chapman and Dr. Witmer Stone, Fellows; Dr. Wm. C. Rives, a Member elected in 1885; and W. L. Baily, a Member, and Dr. Hugh M. Smith, an Associate, elected in 1886 at the first Washington meeting. Among those who came from a distance were Miss Louise P. Ford, of South Carolina; A. F. Ganier, of Tennessee; Mrs. M. M. Nice, of Oklahoma; Dr. T. S. Roberts, of Minnesota; and R. M. Anderson, Major Allan Brooks, W. E. Saunders, and P. A. Taverner, from Canada.

Business Meetings.—The first day was devoted to meetings of the Council which lasted from 10.30 A. M. to 4 P. M., and two evening meetings: one of the Fellows at 7.15 P. M., and the other of Fellows and Members at 8.15 P. M.

By order of the Council, Dr. W. K. Fisher (at his own request) was transferred to the list of Retired Fellows and C. J. Pennock was reinstated in the list of Members. The price of complete sets of 'The Auk' was fixed at \$200 and the annual subscription to non-members was advanced to \$4.00, but members and members-elect may continue to receive the journal at the regular price, \$3.00 per year.

At the meeting of the Fellows one vacancy was filled by the election of Robert Cushman Murphy, of Brooklyn, N. Y., and two amendments to the By-laws were adopted. One of these amendments, in Art. II, Sec. 4, modified the duties of the Treasurer; and the other, in Art. VII, Sec. 1, provided for the election of a board of three trustees to have charge of all the funded property of the Union.

At the meeting of the Fellows and Members, called to order by the President, 23 Fellows and 15 Members were present. Following the roll call and the reading of the minutes of the previous meeting the report of the Secretary was presented, showing a total of about 1140 Members (for details see p. 105). The report of the Treasurer showed the finances of the Union in a more satis-

factory condition than ever before, with a substantial balance of \$2,362.94 in receipts over current expenses, and a total surplus, including income from life memberships and invested funds of \$16,343.71, of which \$6,774.75 is contained in the Brewster Memorial Fund.

The election of officers resulted as follows: President, Witmer Stone; Vice-Presidents, George Bird Grinnell and Jonathan Dwight; Secretary, T. S. Palmer; Treasurer, W. L. McAtee; Members of the Council, Ruthven Deane, Joseph Grinnell, Frederic A. Lucas, H. C. Oberholser, W. H. Osgood, Charles W. Richmond, and T. S. Roberts.

On recommendation of the Council, two Honorary Fellows, 13 Corresponding Fellows and 306 Associates were duly elected (see p. 96). In the election of five Members the States of California, Connecticut, Iowa, Nebraska and Oregon were represented respectively by Loye Holmes Miller, A. A. Saunders, T. C. Stephens, Myron H. Swenk, and I. N. Gabrielson. Fellows, Honorary Fellows and Members are elected from other classes, but Corresponding Fellows and Associates are elected from candidates outside the Union, so that the actual increase in membership was 319, the largest on record.

The Committee on Biography and Bibliography, through its Chairman, Dr. Palmer, presented a brief verbal report showing progress in various lines of work undertaken since its inauguration in 1915.

A replica of the William Brewster Memorial Medal which will be awarded by the Union for the first time in the year 1921, was exhibited by Dr. Chapman, who explained the details of the design and the conditions of the award.

Resolutions were adopted expressing the thanks of the Union to the Secretary of the Smithsonian Institution, the Superintendent of the National Zoological Park, the Librarian of Congress and the Director of the Bureau of Engraving and Printing for various courtesies extended during the Thirty-eighth Meeting of the Union.

Public Meetings.—The meetings devoted to the presentation and discussion of scientific papers occupied three full days, November 9, 10 and 11, from 10.15 A. M. to 5 P. M., and on Wednes-

day until 6 P. M., with an hour or more intermission for luncheon. The program included 38 papers on a wide range of topics relating to North American birds and contributions to the ornithology of Argentina, Nicaragua, Peru, Europe and Madagascar.

Illustration of birds may fairly be said to have been the outstanding feature of the meeting. The nine papers illustrated by lantern slides and the five contributions of motion pictures furnished an opportunity of comparing the best recent work with camera and motion picture machine. Finley's pictures of bird life on the Texas coast shown by Pearson, McClintock's detailed studies of the Least Bittern, Lloyd's views of the Trumpeter Swan, and Murphy's pictures of Peruvian birds were revelations, while Roberts' careful studies of some of the common birds of Minnesota demonstrated that many important facts may be learned from birds near home. Through the cordial coöperation of the Library of Congress a special exhibition of drawings, paintings, photographs and prints of birds was arranged in the Division of Prints and remained in place through the month of November. It not only brought together the best work with brush and camera by a number of American artists, but was supplemented by a series of prints arranged to show the development of ornithological illustration from the earliest times to date. (See beyond p. 161.)

The Passenger Pigeon formed the topic of considerable discussion in connection with Bond's 'Later Flights of the Passenger Pigeon,' while Dr. Shufeldt illustrated with lantern slides the principal published figures of this species. Plumage, including feather arrangement and structure, also formed the subject of several interesting and important papers: A. A. Allen discussed the 'Eclipse Plumage of certain Water-fowl'; W. DeW. Miller the 'Pterylosis of the Avian Wing'; J. P. Chapin the 'Pterylosis of *Monias benchi*' and also the 'Primaries of the Juvenile Plumage of Woodpeckers'; and Dr. Dwight the 'Metallic Plumage of the Purple Grackle.' Chapman and Fuertes illustrated by a series of specimens the 'Postmortem Changes in the Colors of Birds' Feathers' and showed the importance of recording the actual color of feathers in living birds. The fugitive nature of the tints in the plumage of certain species seem to have been better appreciated by bird artists than bird observers. Faunal papers were

represented by Stone's 'Notes on Birds of Cape May, N. J.,' Gazier's 'Birds of Middle Tennessee,' A. H. Howell's 'Birds of South Florida,' Griscom's 'Little Known Birds from Nicaragua,' Murphy's 'Ornithology of the Peruvian Guano Islands,' and Dabbene's 'North American Shore Birds in Argentina.' 'Recent Returns from Trapping and Banding' were reported by S. P. Baldwin and 'Progress in Ornithology in 1920' introduced by Dr. Oberholser was discussed by a number of the members.

The experiment of presenting the more technical papers at a special session seems to have been successful and aroused considerable interest. As a whole more opportunity was given for discussion of the various papers than has been afforded at recent meetings.

Other Events.—On Tuesday evening the members met at dinner in the cafe of the Library of Congress and the early part of the evening was devoted to an examination of the exhibit of bird paintings and photographs. Later, through the courtesy of the Library authorities, the party was conducted through the Divisions of Manuscripts and Maps and shown through the book stacks and the reading room for the blind.

On Wednesday evening the annual dinner was held at the Hotel Ebbitt, when Dr. Fisher entertained the members with a series of lantern slides illustrating the field activities of members of the Biological Survey.

On Friday morning after adjournment of the regular meeting a trip was made to the National Zoological Park, where, under the guidance of Superintendent Hollister, a party of about thirty was conducted through the bird houses and entertained at luncheon. On Friday evening the Committee on Nomenclature and Classification of Birds held a meeting and arranged for expediting work on the new 'Check-List' which is to form a part of the proposed 'Systema Avium.'

On Saturday a party of about thirty members visited Plummer Island, in the Potomac River a few miles above Washington, as the guests of the Washington Biologists' Field Club.

Besides the exhibition of bird paintings and photographs several special exhibits were arranged for the occasion in the United States National Museum. One of these, showing Government

work on birds, included copies of Government ornithological publications issued during the past two years by the National Museum, Biological Survey and the National Park Service and the various lines of activity in economic work, geographic distribution, bird banding, bird migration and bird protection under the direction of the Biological Survey. Another comprised specimens of birds discovered or described 100 years ago, and still another, specimens of the birds which have been added to the list of North American birds since the publication of the 'Check-List' of 1910.

Results.—In addition to opportunities for personal conferences and discussion and for comparison of specimens and consultation of books and records, several important results were accomplished during the meeting. Among these were the increase in the price of 'The Auk' to non-members, plans for the preparation of a decennial index to 'The Auk' for the years 1911 to 1920, and for prosecution of the work on the new 'Check-List,' and the transfer of the business office of the Union from New York to Philadelphia, where in future the records in connection with the collection of dues and subscriptions to 'The Auk' will be kept under the personal direction of the editor.

The next meeting will be held in Philadelphia, Pa., November 8 to 10, 1921.

PROGRAM.

(Papers marked with an asterisk (*) were illustrated by lantern slides.)

TUESDAY.

1. Marriage Relations of the House Wren. S. PRENTISS BALDWIN, Cleveland, Ohio (20 min.).
2. In Memoriam—William Dutcher. T. S. PALMER, Washington, D. C. (30 min.).
3. Some Additional Notes on Birds of Cape May, N. J. WITMER STONE, Philadelphia, Pa. (20 min.).
4. The Later Flights of the Passenger Pigeon. FRANK BOND, Washington, D. C. (10 min.).
5. Notes on the Eclipse Plumage of Certain Waterfowl. ARTHUR A. ALLEN, Ithaca, N. Y. (15 min.).
6. * The Use of Homing Pigeons in the World War. ERNEST HAROLD BAYNES, Meriden, N. H. (30 min.).

7. * The Trained Fishing Cormorants of Japan.¹ H. M. SMITH, Washington, D. C. (20 min.)
8. * The Temperate Zone in South America. FRANK M. CHAPMAN, New York. (20 min.)
9. * Published Figures and Plates of the Extinct Passenger Pigeon. R. W. SHUFELDT, Washington, D. C. (25 min.)
10. * Some Recent Experiences with Kirtland's Warbler. WALTER B. BARROWS, East Lansing, Mich. (30 min.)

WEDNESDAY MORNING.

11. Recent Returns from Trapping and Banding. S. PRENTISS BALDWIN, Cleveland, Ohio. (20 min.)
12. Roosting Habits of Migratory and Winter Birds in Middle Tennessee. A. F. GANIER, Nashville, Tenn. (20 min.)
13. Progress in Ornithology in 1920. Introduced by HARRY C. OBERHOLSER. General Discussion by the Members. (60 min.)
14. * Birds of South Florida. ARTHUR H. HOWELL, Washington, D. C. (30 min.)

WEDNESDAY AFTERNOON—MOTION PICTURES.

15. Bird Life on the Audubon Reservation at Orange Lake, Florida. NORMAN MCCLINTOCK, Pittsburgh, Pa. (45 min.)
16. Trumpeter Swans. HOYES LLOYD, Ottawa, Canada. Presented by Allan Brooks. (10 min.)
17. Some Bird Studies in Motion Pictures. THOS. S. ROBERTS, Minneapolis, Minn. (25 min.)
18. Notes on the Summer Birds of Southeastern Texas. T. GILBERT PEARSON, New York. (45 min.)
19. The Ornithology of the Peruvian Guano Islands. ROBERT CUSHMAN MURPHY, Brooklyn, N. Y. (45 min.)

THURSDAY.

20. * The Pterylosis of *Monias benschi*. J. P. CHAPIN, New York. (20 min.)
21. * The Pterylosis of the Avian Wing. W. DEW. MILLER, New York. (30 min.)
22. Post Mortem Changes in the Colors of Birds' Feathers. F. M. CHAPMAN and L. A. FUERTES. (10 min.)
23. * Sexual Dimorphism in *Sula nebouxi*. ROBERT CUSHMAN MURPHY, Brooklyn, N. Y. (10 min.)
24. * The Primaries of the Juvenal Plumage of Woodpeckers. J. P. CHAPIN, New York. (10 min.)

¹ A similar paper mentioned by Dr. Smith, 'On Cormorant Fishing in Japan,' was presented by P. L. Jouy at the Boston meeting of the Union in 1887 and published in the *Am. Naturalist*, XXII, pp. 1-3, Jan. 1888.

25. Notes on New or Little Known Birds from Nicaragua. W. DeW. MILLER and LUDLOW GRISCOM. (20 min.)
26. Some Notes on European Birds. HENRY OLDYS, Silver Spring, Md. (20 min.)
27. The Metallic Plumage of the Purple Grackle as correlated with Variation. JONATHAN DWIGHT, New York. (20 min.)
28. Nuptial Habits of the Sage Cock. FRANK BOND, Washington, D. C. (10 min.)
29. North American Shore Birds in Argentina. ROBERTO DABBENE, Buenos Aires. Presented by FRANK M. CHAPMAN. (15 min.)
30. Nesting of Mourning Doves at Norman, Okla. MRS. MARGARET MORSE NICE, Norman, Okla. (20 min.)
31. The Estimated Number of Long Island Shore Birds. J. T. NICHOLS, New York. (20 min.)
32. Breeding of the Evening Grosbeak in Northern Wisconsin. O. W. SMITH. Presented by FRANK M. CHAPMAN. (5 min.)
33. The History and Purposes of Bird Banding. F. C. LINCOLN, Washington, D. C. (Read by title.)
34. The Desirability of a Definite Method of indicating the Authorities for Scientific Names. FRANK M. CHAPMAN, New York. (Read by title.)
35. Present Condition of Waterfowl Breeding Grounds on the Great Plains. HARRY C. OBERHOLSER, Washington, D. C. (Read by title.)
36. The Pronunciation of the Scientific Names of Birds. FRANCIS H. ALLEN, Boston, Mass. (Read by title.)
37. Further Contributions to the Ornithology of New Brunswick. P. B. PHILIPP and B. S. BOWDISH. (Read by title.)
38. Some Interesting Records of South Carolinian Birds. ARTHUR T. WAYNE, Mt. Pleasant, S. C. (Read by title.)

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REPORT OF THE SECRETARY.

BY T. S. PALMER.

Membership.—The present membership of the Union is approximately 1140 with at least one representative in every State, in Alaska, Hawaii and the Philippines, in six Provinces of Canada and at least twenty foreign countries. In November, 1919, the total number of members was 1024. The distribution of the membership in each year is shown by the following statement:

Year	Fellows	Retired Fellows	Honorary Fellows	Corre- sponding Fellows	Members	Assoc.	Total
1920	49	3	19	75	86	910	1142
1919	48	3	19	63	84	807	1024

During the past year the Union lost 20 members by death, 16 by resignation and a number by delinquency. The net gain was 118, as compared with a gain of 71 during the previous year. The deaths (counting 6 which occurred in the previous year, news of which was delayed) included those of 1 Fellow, 1 Honorary Fellow, 2 Corresponding Fellows, 1 Member and 15 Associates.

An effort has been made to stabilize the membership by transferring ten per cent. of the members to a life basis. As a result of recent efforts on the part of several members the Union now has 45 life members, including 5 Fellows, 7 Members and 33 Associates.

* Life Associate.

Service.—In addition to answering a large number of inquiries and requests of various kinds, efforts have been made to render service to members and the public along several diverse lines:

(a) To members and public libraries in completing sets of 'The Auk.'

(b) To public libraries and individuals in furnishing full names and dates of birth and death of members (through the Committee on Biography).

(c) To arrange for an interchange of plastotypes of fossil birds of North America between some of the larger museums so that each institution ultimately will have a complete series of plastotypes of all species not represented by types in its own collection. The U. S. National Museum has already made casts of each of its types and is prepared to exchange as soon as other institutions have done likewise.

(d) To make a general survey of the principal bird collections of the world in order to secure for ready reference statistics regarding the number of specimens and also information concerning the character and special features of such collections.

Preliminary figures have been obtained from some of the larger public and private collections in the United States (those containing 5000 specimens or more) and data have also been secured regarding the principal collections of Argentina, Japan and Sweden.

Foreign Relations.—Last year the foreign members including Honorary and Corresponding Fellows numbered 75; at present the number is about 85. Several of the members in eastern Europe and at least two of those in Japan are out of reach.

During the year unusual opportunities have been afforded of meeting foreign ornithologists. At the last annual congress Mr. W. L. Sclater was present and as a result of his visit to America cooperative work on the 'Systema Avium' has been begun with prospects of overcoming many of the difficulties which previously seemed serious. During the spring Mr. F. E. Blaauw, of Gooilust, Holland, visited this country and made an extended trip through the southern and western States before returning home. Dr. T. G. Ahrens, of the Prussian Conservation Bureau, spent some time in Baltimore and Washington. During the summer Mr. W. B. Alexander, of Perth, Western Australia, a member of the

Council of the R. A. O. U., and later Dr. Karl Alwin Haagner, of Pretoria, Transvaal, visited New York, Philadelphia and Washington.

Notices of the annual meeting and copies of the Secretary's report have been sent to Corresponding Fellows and have brought in reply a number of interesting letters thus establishing closer relations with foreign workers.

Of a dozen or more Americans in foreign countries several are at present residing abroad, including Carriker in Colombia, Williams in Cuba, Mitchell in Ireland, Charles Miller in Ceylon, and Zimmer in British Papua. In addition to these, Field, Holt and Peters are now in Brazil, Wetmore in Argentina, Beebe in British Guiana, and Beck in Tahiti, while Bryan has recently returned from Juan Fernandez and Raven has crossed Africa from the Cape to Cairo.

DECEASED MEMBERS, 1919-1920.

WILLIAM DUTCHER,¹ Fellow, died in his 75th year, at Chevy Chase, Md., July 1, 1920.

DR. MAX FURBRINGER, Honorary Fellow, died in his 75th year at Heidelberg, Germany, March 6, 1920.

DR. JOHAN AXEL PALMEN,² Corresponding Fellow, died in his 74th year at Helsingfors, Finland, April 7, 1919.

RODERICK ROSS MCFARLANE, Corresponding Fellow, died in his 87th year at Winnipeg, Man., April 14, 1920.

FRANK SLATER DAGGETT,³ Member, aged 65, died at Redlands, Cal., April 5, 1920.

JOSEPH STOCKDALE BRIGGS, Associate, of Norristown, Pa., died in his 73rd year, 1918.

JOSEPH MOODY ACKERMAN, of Newburyport, Mass., died 1919.

MISS NANCY P. H. ROBBEN, of Lowell, Mass., died 1919.

THOMAS SILSBEE, of Boston, Mass., died April, 1919.

ARTHUR S. ELDRIDGE, of South Lincoln, Mass., died November 6, 1919.

ROYAL ELISHA ROBBINS, of Brookline, Mass., died in his 30th year, February 9, 1920.

ARTHUR FARQUHAR, of York, Pa., aged 16, died at Ithaca, N. Y., February 21, 1920.

JOHN HENRY FLANAGAN⁴ died in his 52nd year at Providence, R. I., February 23, 1920.

¹ For obituary notice, see Auk, XXXVII, p. 636.

² " " " see Auk, XXXVII, p. 511.

³ " " " see Auk, XXXVII, p. 508.

⁴ " " " see Auk, XXXVII, p. 639.

DR. CHARLES GORDON HEWITT,⁶ aged 35, died at Ottawa, Canada, February 29, 1920.

ROBERT LENOX MAITLAND⁶ died in his 66th year at New Rochelle, N. Y., March 11, 1920.

MISS CAROLINE GRAY SOULE, of Brookline, Mass., died April 27, 1920.

MISS FANNIE HUBERTA FOOTE, of Yonkers, N. Y., died 1920.

HORACE WINSLOW WRIGHT,⁷ aged 72, died at Jefferson Highlands, N. H., June 3, 1920.

MISS EMILY HINDS THOMAS, of Bryn Mawr, Pa., died October 17, 1920.

NELSON RUSH WOOD died in his 63rd year at Washington, D. C., November 8, 1920.

GENERAL NOTES

The Horned Grebe (*Colymbus auritus*) at Hatley, Stanstead County, Quebec. Since my last list of the birds of Hatley was written, the above species has been added, making a total in all of 177 species. In Knight's 'Birds of Maine,' 1908, p. 21, we read of the Horned Grebe as occurring rarely in spring and fall in the interior, whilst in the Province of Quebec the same thing seems to occur, judging from the literature on the subject. At Hatley the bird can safely be described as a not common migrant, for I have never seen it on my little marsh, nor yet on Lake Massawippi, and Mr. Greer tells me that in his fifteen or twenty years' experience as a taxidermist no examples have been brought to him to mount until the present season, when two birds were obtained by different parties on Lake Massawippi. One of these was shot on November 1, and the other on November 7, both of which I saw in the mounted state when calling on Mr. Greer on November 20. Apparently this has been somewhat of a 'Grebe' year, for my little marsh has produced several examples of the Pied-billed Grebe (*Podilymbus podiceps*) a bird I had personally never seen there before.--H. MOUSLEY, *Hatley, Que.*

The Glaucous Gull (*Larus hyperboreus*) at Buffalo, N. Y.—On March 24, 1918, while walking along the southern shore of Lake Erie from the Lackawanna Steel Plant to the foot of Louisiana Street, my attention was arrested by the presence of a large, wholly-white gull. The bird was associated with four or five Herring Gulls near shore; it was noticeably larger than its companions, and appeared at a distance to be entirely white. The light was very good at the time, and I was able to

⁶ For obituary notice see Auk, XXXVII, p. 511.

⁶ " " " see Auk, XXXVII, p. 640.

⁷ " " " see Auk, XXXVII, p. 509.

approach quite closely with my glass. The bird now seemed much larger than the attendant Herring Gulls; its plumage was almost uniformly pure white, and the bill was tipped with black. No notes were heard.

There is, I think, no other gull which could reasonably be confused with *Larus hyperboreus* in the white plumage—providing a few Herring Gulls are near at hand for purposes of comparison as to size. The Glaucous Gull remained near shore with its companions during the entire period of the observation, thus enabling one to watch it at very close range. Western New York records for the species are few in number; Eaton, however, classes it as an uncommon but regular winter visitant. It is possible, of course, that the bird does occur along Lake Erie and the Niagara River nearly every winter, but certainly its presence is very rarely reported by observers in the Buffalo area.—THOMAS L. BOURNE, *Hamburg, N. Y.*

Blue Goose (*Chen caerulescens*) in Massachusetts.—On October 30, 1920, at John's Pond, Mashpee, Mass, a female Blue Goose was taken by Mr. Edmund Wright, who has kindly permitted me to record the occurrence. Mr. Wright had the bird mounted by the M. Abbott Frazar Co. and they sexed the specimen.—CHARLES R. LAMB, *Cambridge, Mass.*

American Egret (*Casmerodius egretta*) in Maine.—Scarborough would seem to be a favorite locality for this straggler, as well as other extralimital species which have been recorded from time to time, and I am now enabled to add another record. While crossing the golf links of the Prout's Neck Country Club a beautiful pair flew slowly overhead and after circling over the water and cane of Bloody Pond, just across the highway they alighted. They remained a few days in the immediate vicinity when one of the pair was shot by a boy. Dr. William P. Coues secured the specimen in the flesh, preserved it and has it now in his possession. It proved by dissection to be a female.

A short time before the capture of this bird, Dr. Coues saw a pure white heron standing in the marsh a short distance from the highway between Scarborough and Oak Hill, which was, no doubt, one of this pair. Arthur H. Norton of the Portland Society of Natural History, has furnished me with the following published records of the capture of this species in Maine: 1853, August 22, Scarborough (1883, Smith. Rod and Gun, Vol. xx, p. 104); 1875, April—Scarborough (Brown. Rod and Gun, Vol. VI. p. 81); 1891, April 7.—Gt. Cranberry Island (1897, Knight. Bull. 3. Uni. of Me. p. 39); 1896, August 20, Richmond (1897, Knight. Bull. 3 Uni. of Me. p. 39); 1906, May 3, Millbridge (1906, Knight. Journal Me. Orn. Soc. Vol. VIII. p. 80); 1911, April 23, Scarborough (1912, Brock. Auk. Vol. xxix. pp. 236-7); 1919, July 27, Falmouth (Not hitherto recorded, specimen in the Portland Society of Natural History.)—RUTHVEN DEANE, *Chicago, Ill.*

Some Old Shore Bird Records for the Chicago Area.—Many of the larger waders that the older writers list as once common in the Great Lakes region seem to have entirely disappeared, leaving few dates of actual captures behind them. The N. W. Harris Public School Extension of Field Museum recently obtained a small collection of beautifully prepared skins of waders taken by Mr. Charles Brandler in the once famous Calumet region, within the city limits of Chicago.

Following are a few of the more interesting of these records:

Numenius americanus americanus. LONG-BILLED CURLEW.—Three specimens, two males and one female, taken at Calumet Lake September 22, 1889.

Recurvirostra americana. AVOSET.—Two males taken at 89 St. and Stoney Island Ave. on May 5, 1889.

Limosa haemastica. HUDSONIAN GODWIT.—A male and female taken at Wolf Lake (Illinois side) on October 4, 1889. The female is in full summer plumage, the male about two-thirds changed. Another, a male, was taken at 89 St. and Stoney Island Ave. September 27, 1889.

Limosa fedoa. MARBLED GODWIT.—A fine male taken at Calumet Lake May 15, 1889. This is the only record I know of for the Chicago Area.—H. L. STODDARD, *The N. W. Harris Public School Extension of Field Museum, Chicago, Ill.*

Estimated Numbers of Shore Birds.—In studying the migration of shore-birds on Long Island, the writer has drawn up, for his own future reference, an estimate of the average number of each species which occurred there during the last half of a year for the ten-year period, 1911 to 1920. It will, perhaps, be interesting to others to place this estimate on record, and it is submitted herewith.

Sufficient data are not available to make these figures authoritative. They are based, however, on a fair knowledge of the topography of the whole island, and of the local habits (migration and otherwise) of the different species, and on rather continuous field observation during this period. Such species only as have been personally met with are included. Breeding birds and young successfully reared are included in the estimate, birds which may pass too high for observation, at night, or off-shore (doubtless many Northern Phalaropes), are not. The species are arranged below in order of their estimated abundance.

The figures for no two species have been arrived at in precisely the same manner. One of the methods followed was to multiply the observed average hourly number of individuals passing a point on the main line of flight by the supposed number of hours of active migration for that species and the product by the probable relationship of migration for the whole island to that along the main line of flight. Another method was from count on a favorable feeding ground (through the season) to estimate the entire number of individuals which had occurred on that ground and multiply by the probable relationship of the entire migration

to the part of it tributary to that particular ground. Estimates so obtained were arbitrarily revised to meet probable error due to some known habit of occurrence of a species. But, where actual figures of this sort were available, they were at least held to as a basis. Species, where satisfactory figures were not available, were estimated in relation to the figures for other comparable species.

Semipalmated Sandpiper (*Ereunetes pusillus*) 40,000.

Least Sandpiper (*Pisobia minutilla*) 12,000.

Ring-necked Plover (*Charadrins semipalmatus*) 6,500.

Lesser Yellowlegs (*Totanus flavipes*) 5,000.

Sanderling (*Crocethia alba*) 5,000.

Spotted Sandpiper (*Actitis macularia*) 3,200.

Pectoral Sandpiper (*Pisobia maculata*) 2,200.

Greater Yellowlegs (*Totanus melanoleucus*) 2,000.

Black-breasted Plover (*Squatarola squatarola*) 1,500.

White-rumped Sandpiper (*Pisobia fuscicollis*) 1,500.

Turnstone (*Arenaria interpres morinella*) 1,200.

Woodcock (*Philohela minor*) 1,000.

Wilson's Snipe (*Gallinago delicata*) 1,000.

Dowitcher (*Limnodromus griseus griseus*) 1,000.

Hudsonian Curlew (*Numenius hudsonicus*) 1,000.

Red-backed Sandpiper (*Pelidna alpina sakhalina*) 1,000.

Western Sandpiper (*Ereunetes mauri*) 1,000.

Killdeer Plover (*Oryechus vociferus*) 400.

Solitary Sandpiper (*Tringa solitaria solitaria*) 350.

Piping Plover (*Aegialitis meloda*) 300.

Stilt Sandpiper (*Micropalama himantopus*) excepting 1912, 200 (1912, 3,000).

Northern Phalarope (*Lobipes lobatus*) 150.

Western Willet (*Catoptrophorus semipalmatus inornatus*) 100.

Knot (*Canulus canutus*) 100.

Golden Plover (*Pluvialis dominica dominica*) 100.

Long-billed Dowitcher (*Limnodromus griseus scolapaceus*) 50.

Hudsonian Godwit (*Limosa haemastica*) 10.

Wilson's Phalarope (*Steganopus tricolor*) 5.

Marbled Godwit (*Limosa fedoa*) 1.

A few words in explanation. Discussion with other members of the Linnæan Society of New York, indicates that above figures for the three most abundant species, Semipalmated and Least Sandpipers and Ring-neck Plover, might be considered too low, even allowing for the fact that all figures are intentionally conservative. This is perhaps due to the large proportion of each species that passes through along a narrow "gutter" of migration, the beach side of the south shore bays, between limited dates as compared with the total period when the species is present. When this flight wave bunches up on a favorable feeding ground, in its path it

gives an observer a fictitious impression of a bird's actual abundance. On the other hand, the suggestion that the estimate for the Killdeer is too high is probably due to this species being scattered over the island rather evenly, at no time concentrated at those points where one looks for shore-birds. Figures for the Western Sandpiper are admittedly unsatisfactory due to the difficulty in always distinguishing it from the abundant Semipalmated Sandpiper.

As to changes during the ten-year period, unusually large numbers of the Greater Yellow-legs in 1919, unusually small numbers of that species and the Black-breasted Plover, and large numbers of the Hudsonian Curlew in 1920, are probably fortuitous as was one of the well-known periodic flights of the Stilt Sandpiper in 1912. The changes of perhaps greater significance which the writer believes to have occurred over the ten-year period are as follows: a marked decrease of the Semipalmated Sandpiper; a decided increase of the Pectoral Sandpiper and Wilson's Snipe; an appreciable increase of the Dowitcher, Stilt Sandpiper, and Golden Plover; a gradual increase and decrease again of the Western Willet and greater frequency of the Marbled Godwit in the closing years.

The question which naturally follows upon the above remarks is what relation the present numbers of shore-birds bear to those of the past. So far as data with which the writer is familiar are concerned numbers in the past are for the most part a matter of pure hypothesis; in fact the present estimate has been drawn up with the idea of having something a little more definite to go by in the future. To judge from hearsay and some shooting data about thirty years before the decade under discussion the two Yellow-legs, Black-breasted Plover and Hudsonian Curlew, are present in approximately the same numbers now as then, the Pectoral Sandpiper and Dowitcher have fallen off. Of course, we know that the Golden Plover has fallen off greatly from its one-time abundance, but the break probably occurred more than thirty years ago. The south-shore gutter along which the majority of migrants flow is still full of them, giving an impression of greater abundance than really exists, whereas formerly they very probably overflowed from it into considerable territory which is now unoccupied. The apparent recent increase in the Pectoral Sandpiper and Dowitcher, species which had been notably reduced even along their main migration route, and of the Golden Plover, is a hopeful sign as regards efficiency of recent legislation. One could not expect signs of increase even if such an increase exists in species where there has been little apparent falling off for many years.—J. T. NICHOLS, *American Museum Nat. Hist., New York City.*

Prairie Chicken (*Tympanuchus americanus*) in Arkansas.—On November 15, 1919, an adult female was shot by a farmer about eight miles west of this city. No others were observed. Undoubtedly it was a straggler. The species is extremely rare in the State. Have not had reports of its occurrence in the past eight years.—ALBERT LANO, *Fayetteville, Ark.*

American Osprey (*Pandion haliaetus carolinensis*) in Arkansas.
A beautiful adult male was shot by a young farmer about two miles north of this city on September 20, 1919. The body was extremely fat but the stomach was empty. The species was formerly a common summer resident along the larger streams within the State, but has not been observed since September 19, 1892 (see Bull. No. 38, U. S. Biological Survey).—ALBERT LANO, *Fayetteville, Ark.*

Description of a New Species of *Sittasomus* from Northeastern Brazil.—*Sittasomus cearensis* sp. nov.—Type from Jua near Iguato, Ceara, N. E. Brazil. Male, No. 50592, Field Museum of Natural History. Collected by R. H. Becker, August 18, 1913.

Distinguishing Characters.—Male. Crown and nape grayish brown tinged with rufous; back more strongly tinged with rufous and shading to rusty rufous on the rump; exposed wings, and tail, chestnut rufous; underparts of body brownish buff with a slight tinge of rufous on the belly; crissum rufous; under wing-coverts pale yellow, slightly tinged with rufous. Wing, 70; tail, 69; exposed culmen, 11 mm.

This form is nearest to *S. erithacus* (Licht.) but can be distinguished at a glance by the buffy (not ochraceous) underparts, the differently colored crown and back and the lighter colored wings and tail.

The forms belonging to the Genus *Sittasomus*, so far known, with type localities are as follows:

Sittasomus erithacus (Light.), San Paulo, Brazil.

" *chapadensis* Ridgway, Chapada Matto Grosso.

" *amazonus* Lafr., "ad summum Amazonum."

" *cearensis* Cory, Jua near Iguato, Ceara Brazil.

" *sylvioides sylvioides* Lafr., Mexico.

" *sylvioides jaliscensis* Nelson, San Sabastian Jalisco, Mexico.

" *sylvioides levis* (Bangs), Bouquette Chiriqui Panama.

" *griseus griseus* Jardine, Tovago.

" *griseus phelpsi* Chapman, caripe Bumudez, Venezuela.

" *griseus virescens* Hellmayr and Leilern, Cumbre de Valencia, Venezuela.

" *aequatorialis* Ridgway, Guayaquil, Ecuador.

C. B. CORY, Field Museum, Nat. Hist., Chicago, Ill.

An Arkansas Kingbird (*Tyrannus verticalis*) at Ipswich, Massachusetts.—On September 19, 1920, the third day of strong northwest winds, I saw an Arkansas Kingbird at Ipswich. It had alighted on a telephone wire by the roadside about two miles from the sea. From here it made several sallies after insects and later flew to a small tree where I watched it within twenty feet. The black tail with white lateral edge, the yellow belly, the gray back and gray-white throat made its recognition certain and easy.

The previous instances of the occurrence of the Arkansas Kingbird in New England are as follows: one taken by Mr. George E. Brown at

Elliot, Maine, in October, 1865 (Bull. Nutt. Ornith. Club, Vol. 1, 1876, p. 73); one taken by Mr. Frederick A. Kennard at Monomoy Island, Chatham, Mass., on October 20, 1912 ('Auk,' Vol. 30, 1913, p. 112); one taken by Mr. L. C. Jones at Falmouth, Mass., on November 10, 1918, now in the mounted collection of the Boston Society of Natural History; one, long dead, picked up by Mr. D. L. Garrison on the snow at Marston's Mills, Cape Cod, on February 9, 1920 ('Maynard's Walks and Talks with Nature,' Vol. 12, 1920, p. 34).—CHARLES W. TOWNSEND, M.D., 98 Pinckney St., Boston, Mass.

Arkansas Kingbird in Massachusetts.—On November 20, an Arkansas Kingbird (*Tyrannus verticalis*) was flushed upon the beach at Marblehead Neck, Mass., where it was feeding on insects that covered the seaweed. The writer was with several members of the Brookline Bird Club at the time. The bird, seemed very reluctant to leave the place where we found it, making a short flight, and upon being followed up returned to the beach each time.

So far as I know, this bird has only been recorded in Massachusetts five or six times.—CHARLES B. FLOYD, *Auburndale, Mass.*

Arkansas Kingbird in New Jersey.—On November 14, 1920, I found an Arkansas Kingbird (*Tyrannus verticalis*) near Princeton, in open fields on the Middlesex County side of the Millstone River, between Carnegie Lake and the Pennsylvania Railroad. After some chasing, I succeeded in studying it with the usual 8x glasses for a satisfactory period of several minutes as it sat but a few yards from me, on a low wire fence. The mid-day sun at my back, shining from a cloudless sky, showed me the visitor's colors and markings to a nicety—the light gray head with the dark area about the eye, the greenish hue of the back, and—when four times the bird flew down to pick something from the ground—the white lateral margins of the dark tail were as well noted as the color-pattern of wings and underparts. The day was the third of the first really cold snap of the season, with ice nearly a half-inch thick in places; and frost which, in the shade, remained unmelted all day.

The only other Princeton record of this western species is of one taken September 29, 1894, by Professor A. H. Phillips, and now No. 7 of his collection. There is apparently one other record for New Jersey—"near Moorestown" (Turnbull, 'Birds of E. Penna. and N. J.,' 1869).—CHARLES H. ROGERS, *Princeton Museum of Zoology, Princeton, N. J.*

Evening Grosbeak at Sault Ste Marie, Mich.—My first Evening Grosbeak for this winter, a male, arrived November 18, 1920. I have kept Sunflower seed out both winter and summer for several seasons. As this is the original type locality where the first specimen of the Evening Grosbeak was secured in April, 1823, the character of its occurrence here at the present time is of more than ordinary interest.

In the winter of 1917-18 I only had one visit, three males and one female, February 24, 1918; but every other winter since 1915-6 I have had a flock of from forty to sixty about the house all the time.

Heretofore the first arrival has been from October 15 to 23, and they stay until the end of May, the last to go leaving May 20 to 29. I had about made up my mind I would not get my flock this year, but this morning I heard one and on investigation soon located it. This is the usual procedure, first one arrives, a male, apparently to investigate, then leaves and in three or four days the flock arrives.

Just as I have the Evening Grosbeaks in winter, so I have a flock of some 30 to 75 Purple Finches in summer. They arrive March 22 to April 22 and depart October 21 to November 17. These two flocks together with my many casual visitors require 500 pounds of Sunflower seed a year.—M. J. MAGEE, *Sault Ste. Marie, Mich.*

The Grasshopper Sparrow in the Montreal District.—On the morning of June 26, 1920, while passing through a well-cultivated farming district in Chambly County, Prov. Que., about three miles from the Richelieu River, I heard from the roadway a bird's song that arrested my attention. Although it was new to me the weak insect-like buzz instantly suggested the Grasshopper Sparrow. I soon discovered the bird, perched on a fence post, where a good view was offered of its whitish unstreaked breast. Being very familiar with the Savannah Sparrow's song I was impressed at once with the similarity and the difference. The Savannah's song to me is "tsip-tsip-tsip-t-z-z-z-z-z—tser-r-r," while this bird sang "tsip-ip-tz-z-z-z-z-z-z-z-z-z." Outside of the introductory "tsips" the Savannah's song contains two main parts, whereas this bird, which proved to be the Grasshopper Sparrow (*Ammodramus savannarum australis*) had only one.

On my near approach the bird flew in an erratic, zig-zag manner, and dropped into the grass after a flight of over a hundred yards. I flushed it again with difficulty and finally lost sight of it in the border of some small tree growth where it had taken shelter. Returning at dusk I listened in vain for a repetition of the song, although Savannahs were singing abundantly as well as a few Vesper Sparrows.

Although, at the time, I was quite satisfied with the bird's identity, the days following brought a growing uncertainty and I returned to the locality on July 5. Arriving at the same place about 10.30 a. m. I soon located three singing males. All of these birds were singing from the ground and not from swaying plant stems as is the custom of the Savannah Sparrow, and it was only after considerable effort that I succeeded in flushing one of them, which I eventually secured. The flight in all instances was of a zig-zag nature and quite prolonged, and was easily distinguishable from that of the Savannah and Vesper Sparrows, which are the common sparrows in this particular locality. Returning toward dusk I again failed to hear the Grasshopper Sparrows singing, although as usual

the Savannahs were singing from fence posts in all directions. The immediate vicinity of the locality referred to is almost entirely under cultivation—fields of timothy and clover, oats and buckwheat prevailing, interspersed with pasture lands. Besides Savannah and Vesper Sparrows, Bobolinks were nesting commonly, as well as a few Meadowlarks. In my estimation the Grasshopper Sparrow is distinctive in habit and song but might easily be overlooked. Chapman speaks of pointing out this bird to a friend who was not familiar with it and who was very much surprised on going home to find it there also. In the hand, a cursory lateral view of the bird gives the impression of a diminutive female Bobolink.

Until quite recently there has been an apparent dearth of records for this sparrow from the Canadian border. In the North, at least, it is evidently more partial to inland than to coastal regions as Knight (1908) reports it as a rare bird in Maine; while New Brunswick and Nova Scotia appear to be without definite records, although Moore feels certain he has seen it at Scotch Lake (Macoun, Catalogue of Canadian Birds, 1909). In central New York it has been reported from several localities, and especially from Oneida County, where Bagg (Auk, 1897, 1900) found it rare during 1895 and common in the year 1900, during an apparent influx of austral birds. Records for Canada are confined to a few localities. McIlwraith (1892) reports it from Hamilton and London, Ont., and Macoun (1909) cites records of Fleming from Toronto—one specimen in the year 1879 and one in 1890.

Macoun also quotes Saunders, who finds it a fairly common bird in the vicinity of London, Ont., and more so to the southwest of London (Peelee district?). This district is probably the most important station thus far discovered for the Grasshopper Sparrow in Canada. The appearance of several other austral birds in the vicinity of London and Point Pelee—notably Cardinal, Carolina Wren, Prairie Warbler, and Yellow-breasted Chat—suggests the theory that this is a favorable point of ingress. When we have a greater number of observers in Quebec it may be found that the Lake Champlain, Richelieu River Valley, is the principal highway for birds that are extending their range into Quebec Province. It is notable that I have unpublished reports of an Orchard Oriole seen at Lacolle, on the Richelieu, during two consecutive summers (1919, 1920). Further, at Chambly, also on the Richelieu, a Towhee was seen by several persons.

Other records for the Grasshopper Sparrow in Canada are: Ottawa, June 30, 1909 (Eifrig, Ottawa Naturalist, 1911); Ottawa, June, 1898 (Macoun, Ottawa Naturalist, 1898); Hull, Que., June, 1898 (*ibid.*). The Hull record is the only other for Quebec Province so far as I can learn.—L. McI. TERRILL, 44 Stanley Ave., St. Lambert, P. Que.

New Nesting Areas of Kirtland's Warbler.—On June 1, 1920, I located a colony of Kirtland's Warbler along the upper Muskegon river in Clare County, Michigan. Although no nests were found, at least a

dozen males were in full song and there can be little doubt that nesting had begun. This point is about forty miles from the original place of nest discovery in Oscoda County, and nearly as far from Grayling, Crawford County, near which place I found the bird nesting in 1918. The Clare County locality is on the western watershed of the lower peninsula, the Muskegon flowing into Lake Michigan. The altitude is approximately 600 feet above the Lake or about 1200 feet above sea-level.

Three weeks later, June 20, 21, 22, I found this warbler nesting in numbers in the Michigan National Forest, in Iosco County, about 20 miles southeast of the Oscoda County discovery and about forty miles northeast of the Clare County station noted above. Colonies were found at two different points within two or three miles of each other, and twenty-five or thirty pairs in all were located. After our return one of the forest rangers reported a third colony a few miles farther away. The single nest found contained one egg of the warbler and three eggs of the Cowbird, while a fourth Cowbird egg lay on the ground just outside the nest. Subsequently the warbler laid another egg and apparently removed one of the Cowbird's. Here the birds were found among young Jack pines on land which had been burned just five years before. The altitude is less than 100 feet above Lake Huron, or between 600 and 700 feet above sea-level, which upsets our previous belief that the nesting grounds were restricted to the higher Jack pine plains. This region is drained by the Tawas River which is not a tributary of the Au Sable but empties directly into Lake Huron.

So far as we now know Kirtland's Warbler is restricted in the nesting season to an equilateral triangle of about forty miles on a side, with its points in Crawford, Iosco and Clare Counties. A more extended notice may be looked for in a later number of 'The Auk.'—WALTER B. BARROWS, *East Lansing, Mich.*

Female Bay-breasted Warbler in Male Plumage.—An adult female Bay-breasted Warbler (*Dendroica castanea*) was taken at South Chicago, Ill., on May 21, 1915, that is of more than ordinary interest. The cheek patches and forehead are gray instead of black, otherwise the specimen is in the plumage of the adult male. The ovaries and undeveloped eggs were prominent and showed no sign of disease. The bird was also under-sized as the following measurements show: length (skin), 4.40 in.; wing, 2.60 in.; tail, 2 in. The small size was evident in life which led to the capture and careful examination of the specimen.—H. L. STODDARD, *The N. W. Harris Public School Extension of Field Museum, Chicago, Ill.*

Bewick's Wren and the Cape May Warbler in Kansas.—*Thryomanes bewicki bewicki*. BEWICK'S WREN.—This species has not, so far as I am aware, been included in any of the lists of Kansas birds outside of Goss's 'History of the Birds of Kansas,' 1891. Snow's 'Catalogue of

the Birds of Kansas,' fifth edition, 1903, does not mention this bird, nor do the more recent lists of Bunker, 1913, and Douthitt, 1919. It may be of interest, therefore, to note that on April 10, 1920, I shot a specimen of Bewick's Wren, about two miles due south of Lawrence. The bird was actively flitting about in some thorn bushes bordering a main road, a short distance from the Wakarusa river. The identification was verified by the Bureau of Biological Survey, Washington.

Goss classifies this species as a very rare summer resident arriving about April 1, saying that it begins laying in May and leaves about the first of October. To which particular part of Kansas his remarks pertain is not stated, but it is probably the southeastern portion. Harris, in his 'Birds of the Kansas City Region,' 1919, states that the northward extension of the range of Bewick's Wren "has probably already reached the extreme south and east borders of the county, as it has been regularly seen in the adjoining county (Johnson) since 1907." The reference is to Jackson and Johnson Counties, Missouri.

Dendroica tigrina. CAPE MAY WARBLER.—This species is not mentioned in any of the Kansas lists but a record for May 11, 1912, is given by Harris in his above-mentioned work as being obtained "over the state line in Johnson County, Kansas." On May 17, 1920, I observed a Cape May Warbler in the company of four Black-polls, in the outskirts of Lawrence. These birds were in some tall, neglected thorn hedges between a pasture and a cultivated field. A few days later Mr. Jean Linsdale, a careful and accurate observer, reported to me that he had seen a Cape May Warbler on the 15th of the month, about three or four miles northwest of Lawrence.—CHARLES E. JOHNSON, *Department of Zoology, University of Kansas, Lawrence, Kan.*

Sociable Water Ouzels.—In the late afternoon of July 2, 1916, at Fort Bidwell, Modoc County, California, I was standing on a bridge over a small stream flowing southerly from Bidwell Peak into Upper Lake, in the little village built up about this old military reservation. Upper Lake, which is alkaline, lies close against the timbered Warner Mountains on the west that form part of the divide between Sacramento River and the great arid interior basin. The stream is partly diverted for local irrigation purposes about the village, and many small deciduous trees flourish along its banks and tributary ditches. Just above the bridge, the stream makes a right-angled turn and inside this angle stands the village bank, built of brick, having a wooden lean-to or shed in the rear, projecting slightly over the water, here flowing rapidly under overhanging trees.

Looking downstream from the bridge, a Water Ouzel (*Cinclus mexicanus unicolor*) was noticed standing on a stone in midstream, facing first one way then another, bowing and dipping and evidently in search of food, for suddenly it ran into and under the water, brought out something in its bill and flew upstream, made the sharp turn and disappeared back of

the bank building. The bird repeated this performance until it was too dark to see her. In the meantime, the expectation of hearing the male's famous mountain song was not realized. Early the next morning, I posted myself on the bank at the sharp turn in the stream, where a view was had down under the bridge and up back of the lean-to. Soon the bird, which was presumed to be the female, as no song was heard, flew upstream as before, under the bridge, made the sharp turn so near me that her white nictitating membrane was plainly visible, and alighted on a stone directly back of the bank building. After a few seconds, she flew up under the eaves of the lean-to, whereat many cries could be heard from her hungry family, the bird returning downstream for additional supplies. As close inspection as possible revealed the bird's somewhat bulky nest placed on a horizontal timber near where it joined a rafter and close against the end of the shed. The nest was placed directly over and some eight feet above the water, a site frequently chosen by Phoebe's. The light was very poor, so that the material of which the nest was composed could not easily be determined in the time at my disposal. At all times the bird appeared totally oblivious to my presence and to her urban surroundings, and was as much at home in the heart of the village as in her customary haunts along remote mountain torrents.

The object of this note is not alone to call attention to the occurrence of the Water Ouzels living under such civilized conditions, but also to place on record this radical departure from their ordinary nesting habits. There is perhaps a discoverable explanation for this departure. As far as my observations go, the Water Ouzel is a remarkably solitary bird, each pair exacting a widely spaced nesting area in which they reign supreme; and nesting conditions such as the bird usually selects, while confined to mountain water courses and their immediate vicinity, occur in great abundance throughout their chosen range. The theory that pressure on the food supply forced the birds to an uncongenial environment at this season of the year can scarcely be seriously advanced. It may well be, however, that an unusually severe season in the neighboring mountains froze up and rendered inaccessible their customary winter feeding ground, and that they moved downstream to the first open rapids, affording the necessary food supplies, which happened to be in the village, with the result that they nested here as well.

I did not have the good fortune to see or to hear the male, and his whereabouts were unknown to me, but business men nearby told me that he sang daily in the vicinity of the bridge.—CHARLES L. WHITTLE, 50 Congress St., Boston, Mass.

Hudsonian Chickadee (*Penthestes hudsonicus*) at East Lansing, Mich.—Two Hudsonian Chickadees, always in company, spent a large part of the winter of 1919-1920 on the Agricultural College campus at East Lansing, Michigan. I first heard and saw them on December 16, 1919, but owing to a driving snowstorm was not sure of the identification.

On January 5, 1920, both birds were feeding about my feet in a little thicket of Japanese quince and allowed me to study them carefully at a distance of three or four feet. To the best of my knowledge and belief they were typical *hudsonicus*.

After that the pair was seen almost daily through January and February, the last positive record being on March 14, 1920. Their husky, wheezy notes, of course, were quite distinctive, but occasionally their "chick-a-dee-dee" seemed identical with that of the common Black-cap. They did not seem to care for the society of the common Chickadee, although once or twice they formed part of a mixed company of Woodpeckers, Chickadees, Brown Creepers and Nuthatches which visited my house several times daily. However, they were never seen at my feeding station where the suet and cracked nuts brought the other birds.

This appears to be the first positive record of this species in the Lower Peninsula of Michigan.—WALTER B. BARROWS, *East Lansing, Michigan*.

Blue-Gray Gnatcatcher in Massachusetts.—In the July issue of 'The Auk,' the late Mr. Horace W. Wright of Boston recorded finding a Blue-gray Gnatcatcher on Boston Common on May 18. I can report having found one three days earlier, i. e., the 15th, in West Roxbury, in company with a flock of warblers consisting of Parula, Myrtle, Magnolia and Black and White, in a rather thick growth of hemlocks. This bird fed in the tops of the hemlocks with the warblers and I watched it while in the company of several members of the Brookline Bird Club, for some time. When last seen, it was moving along with the warblers.

The fact that the bird was found in Massachusetts in the Spring is especially worthy of record, as it is found more or less frequently in the Fall.—CHARLES B. FLOYD, *Auburndale, Mass.*

Unusual Visitors at Elizabeth, N. J.—The following records may be worth noting:

Aix sponsa. WOOD DUCK.—A rare bird in this vicinity for many years, until 1916. Now a regular summer resident and a prolific breeder. Earliest appearance of young broods on the water during past three years: 1918, May 12, seven young; 1919, May 11, seven young; 1920, May 23, twelve young. Judging from size and actions the last had been on the water several days. All the pairs nesting near here are not equally early breeders.

Chen hyperborea hyperborea. LESSER SNOW GOOSE.—One bird out of three taken on salt meadows October 29, 1917. Wing measured 14.75 inches.

Olor columbianus. WHISTLING SWAN. An immature bird taken alive, exhausted, October 29, 1916.

Casmerodius egretta. AMERICAN EGRET.—A flock seen on the salt meadows August 4, 1917. Previous local record about ten years earlier when a large flock spent all of August and part of September.

Florida coerules. LITTLE BLUE HERON.—Three immature white birds were found in a small fresh water swamp on August 29, 1920, where they remained until September 12 or a few days later. The greenish yellow legs gave the deciding evidence of their identity. No dark tips could be seen on the primaries of two of the birds, either when wings were closed or extended, and I had opportunity to observe them feeding and preening at close range with glass. In the third bird the dark tips were only faintly discernible when the bird was flying overhead with sunlight coming through the wings. The outer half of the bill in all was much darker than the basal half, and in two the outer half appeared almost jet black. They were relatively tame—tamer than the Black-crowned Night Herons, the Little Greens and the Great Blues with which they associated—and when disturbed they did not leave the swamp (which was relatively small) as did the other species.

Tringa solitaria solitaria. SOLITARY SANDPIPER.—A partial albino was seen August 29, 1920. The white was on the outer half of the wings and was fairly evenly balanced. In flight the bird made a striking picture.

Cryptoglaux acadica. SAW-WHET OWL.—One seen February 16, 1919, and another (or possibly the same individual) in the same spot March 21, 1920.

Corvus corax principalis. NORTHERN RAVEN.—Two birds seen on an "island" in the salt meadows May 31, 1919.

Hesperiphona vespertina vespertina. EVENING GROSBEAK.—Fourteen seen December 31, 1916, and the same number in about the same locality February 23, 1920.

Acanthis linaria linaria. REDPOLL.—Abundant here from December 10, 1916, to March 11, 1917, and again from December 1, 1919, to March 21, 1920.

Spinus pinus. PINE SISKIN.—A dozen seen December 31, 1916. One seen January 25, 1920, and another May 9, 1920.

Mimus polyglottos polyglottos. MOCKINGBIRD.—One bird seen and heard May 11, 1919.—CHARLES A. UERNER, *Elizabeth, N. J.*

Notes on Five Birds Taken Near Charleston, South Carolina.

Empidonax flaviventris. YELLOW-BELLIED FLYCATCHER.—I wish to place on record the capture, by myself, of a third specimen of this rare autumnal migrant on September 16, 1920. This specimen was shot from a clump of viburnum bushes in low, swampy land, and is a young female. For previous records of the capture of this bird by the writer see 'The Auk,' XXX, 1913, pp. 273-274, and XXXVII, 1920, p. 92.

Empidonax minimus. LEAST FLYCATCHER.—On September 8, 1920, I shot a young male of this bird from a viburnum bush within less than a mile of my house. Upon picking the specimens from the jungle I was struck immediately with its small size and horn-colored lower bill and was satisfied that I had at last taken a bird of this species that I had

never before seen alive, and hastened home to consult Mr. Ridgway's 'Birds of North and Middle America.' My specimen did not fit Mr. Ridgway's description in regard to the emargination of the tail, but agreed in other respects. In order to place the identification beyond question I sent the specimen to Mr. Outram Bangs and asked him to make a careful comparison, as the bird in question, if really a Least Flycatcher, was new to the fauna of South Carolina, there being no valid record of its occurrence. Mr. Bangs wrote me under date of September 21, 1920, as follows: "I have carefully compared the flycatcher you sent and should without any doubt call it *Empidonax minimus*. The only thing I could see that was not quite right was the tail, which seems to be not so much emarginate or slightly forked as it should; but perhaps being a young bird just moulted into autumn plumage the tail may not be fully developed."

Long years ago I sent a somewhat similar "suspect" to Mr. William Brewster for identification, hoping it would prove to be a Least Flycatcher. But Mr. Brewster wrote me that the specimen was somewhat too large and the tail not sufficiently emarginate for *E. minimus* and that he considered it an example of *E. trailli alnorum*. I believe I sent this bird to Dr. Leonard C. Sanford and it must be now in the American Museum of Natural History. The actual capture of the Least Flycatcher is an addition to the fauna of South Carolina.

Vermivora pinus. BLUE-WINGED WARBLER.—In 'The Auk' for July, 1920, p. 462, I recorded seeing a bird of this species which I was unable to secure. I made no mistake in my identification of this bird despite the fact that it was the first one I had ever seen alive. I now wish to record the taking by myself of three specimens that I shot near Mount Pleasant. On September 4, 1920, I shot a young male, after a long chase, from the top of a live oak tree fifty feet above the ground, and on September 11, I obtained a young male and a young female, both shot from live oak trees. The female, which has the wing bars yellow as in *Vermivora chrysoptera*, was taken within a quarter of a mile of my house. These three birds are the only examples taken in South Carolina since Mr. Leverett Mills Loomis secured one at Chester on April 30, 1887 (Auk, VIII, 1891, p. 169).

I had not overlooked this species during the past 37 years that I have devoted exclusively to ornithology; and my belief is that since the wholesale destruction of the primeval forests along the coast, within the past fifteen years, this area has become covered with a second growth of bushes and small trees and the Blue-winged Warbler has found here a region to its liking during the migrations.

Dendroica discolor. PRAIRIE WARBLER.—On October 1, 1920, while I was within a quarter of a mile of my home, I saw a lovely yellow warbler fly across a road and alight in a small patch of rice. Never before in all my life had I seen such a strange as well as beautiful bird, and wondered

what species it could be. As the bird was extremely restless it was difficult to get a fair shot at it and as I did not want to lose so rare a prize I took a chance shot and luckily secured it in perfect condition. Upon lifting it tenderly from the ground I was momentarily puzzled as to the species I had secured, but as I examined the bill, wings and tail, I found that I had taken a unique, partly albino Prairie Warbler (*Dendroica discolor*). This exquisite bird is an adult female and is colored as follows: head, nape, neck, and most of the back canary yellow; throat of the same color becoming paler on the breast and abdomen. There are a few reddish brown feathers on the right side of the back and the wings and tail have many pure white feathers showing. These pure white feathers, however, do not correspond, as is usual in most birds that show albinism, and differ in position on either side. The bill, legs and feet are pure white, and the streaks on the sides of the body faint or nearly obsolete.

***Hylocichla ustulata ustulata*. RUSSET-BACKED THRUSH.**—In 'The Auk' for July, 1920, pp. 465-466, I recorded two specimens of this bird taken by me near Charleston on October 22, 1901, and May 3, 1902, and expressed my belief that I had not shot six Olive-backed Thrushes since 1883. Since the above was sent for publication I carefully looked through all my bird registers which go back systematically to 1884, and find that I have taken three so-called Olive-backed Thrushes up to 1920, a typical specimen having been secured on May 5 of that year. One bird taken October 18, 1901, was missing and I tried to ascertain the person to whom I had sent it. I finally located it, in the collection of Mr. John Lewis Childs, who kindly loaned it to me. This bird taken here on October 18, 1901, is a male and was labeled by me *Turdus ustulatus swainsonii*. It is, however, an undoubted example of the Russet-backed Thrush as I had suspected when I wrote to Mr. Childs. I wish to state that shortly after I had sent the MS. to Dr. Stone for publication on the two Russet-backed Thrushes, Dr. Chapman very kindly sent to me two birds of that species, one from Sinaloa, Mexico, taken in September by J. H. Batty, and the other from San Diego, California, taken in May by F. X. Holzner. The South Carolina birds were again carefully compared and matched the birds sent by Dr. Chapman feather for feather. ARTHUR T. WAYNE, *Mt. Pleasant, South Carolina*.

Two Rare Birds in the Chicago Area.—On September 7, while walking along the beach of Lake Michigan, I noticed a Hudsonian Curlew (*Numenius hudsonicus*) on the little stretch of sand immediately in front of the Liberty Building in Jackson Park. The bird was very tame and excited a great deal of interest among the people who were watching it. It remained in this rather exposed place all afternoon.

On September 26, I noticed several large gray sparrows in company with a large flock of White-throats (*Zonotrichia albicollis*). Upon closer examination they proved to be Harris' Sparrows (*Zonotrichia querula*). Two individuals were positively identified as this species and several

others seemed larger and grayer than the White-throats. This is a rare bird in our area.—NATHAN F. LEOPOLD, 4754 Greenwood Ave., Chicago, Ill.

Rare Birds in the Indiana Sand Dunes.—**Picoides arcticus.** ARCTIC THREE-TOED WOODPECKER.—A fine male of this species was taken one mile west of the Dune Park station in Porter County, Indiana, October 3, 1920. Another, also a male, was taken a mile and a half east of Dune Park on October 24, 1920. These specimens constitute the second and third Indiana records and were taken within four miles of where the first specimen was taken March 11, 1917 ('Auk,' Oct. 1917, pp. 487). The specimen taken October 24 appeared rather shy and wild, flying nervously from tree to tree uttering a loud and rather startling note, a rapidly repeated 'teck-teck-teck.' The other was extremely tame, industriously digging grubs out of a small dead scrub pine from which he had the bark almost stripped. It seems remarkable that these northern birds should appear so far south before cold weather had set in.

Zonotrichia querula. HARRIS'S SPARROW.—An immature female of this species was taken at Millers, Lake County, Indiana, on October 3, 1920.

Spizella pallida. CLAY-COLORED SPARROW.—A female was taken at Dune Park, Porter County, Indiana, on May 25, 1919. These records are the second for Indiana in each case to the best of my knowledge. Careful examination of the large migrating flocks of sparrows in the north-western part of the State should reveal a few Harris's Sparrows as it does all along the eastern border of their range. A specimen was seen about fifty miles north of here, in Jackson Park, Chicago, September 30, a circumstance that caused me to look for them in the Dunes.

The skins of the specimens taken are in the Harris Extension Collection.—H. L. STODDARD, N. W. Harris Public School Extension of Field Museum, Chicago, Ill.

Additions to the Birds of Lake County, Minnesota.—A visit to Lake County during the latter part of the summer of 1920 resulted in the following additions to my list, published in 'The Auk,' October, 1920, p. 541:

Colymbus auritus (Linn.). HORNE GREBE.—August 6 three Horned Grebes were observed at close range near the south shore of Lake Bald Eagle.

Pisobia maculata (Vieill.): PECTORAL SANDPIPER.—August 25 four specimens were shot and about two dozen others observed on a mud-flat in the Isabelle River some distance below Rice Lake.

Pelidna alpina sakhalina (Vieill.). RED-BACKED SANDPIPER.—August 25 one of these birds, in the company of four Yellow-legs, was shot along the Isabelle River about a mile below Rice Lake.

Ereunetes pusillus (Linn.). SEMIPALMATED SANDPIPER.—August 20 one was shot out of a flock of four on the east shore of Lake Isabelle. On

the 25th several were observed, and one specimen was shot from among a flock of Pectoral Sandpipers, in the locality mentioned above under the last-named species.

Loxia curvirostra minor (Brehm.) CROSSBILL.—August 9, 11, 16 and 23 Crossbills were observed at various points along the Isabelle River between Lake Bald Eagle and Rice Lake. Most of the flocks were small, consisting of not over a half dozen individuals, but on the 11th a flock of twenty-three was seen at our camping place at Bald Eagle.

Passerculus sandwichensis savanna (Wils.). SAVANNAH SPARROW. August 6 a Savannah Sparrow was seen along the Isabelle river at Lake Bald Eagle. During the 26th, 27th and 28th, while enroute to Rice Lake, several were seen and one was shot, along the upper courses of the Isabelle River.

Melospiza lincolni lincolni (Aud.). LINCOLN'S SPARROW.—This shy bird was found to be fairly common in the low dense shrubbery bordering many portions of the streams in the territory between Lakes Gabro and Bald Eagle. They were most frequently observed where the streams had their course through grassy meadows. August 8 and 30 an immature and an adult specimen respectively were shot at Bald Eagle.

Melospiza georgiana (Lath.). SWAMP SPARROW.—Between August 14 and 30 this species was found to be common in the territory between Lakes Rice and Bald Eagle and along the Island River, where many of our observations were made during that period.

Progne subis subis (Linn.). PURPLE MARTIN.—August 3 to 5 numerous Martins were observed above the meadows bordering the Isabelle River and its tributary, the Snake River, just before the first-named enters Bald Eagle. None was seen thereafter.

Riparia riparia (Linn.). BANK SWALLOW.—Several were observed among the Martins in the locality mentioned and a single individual was seen at Rice Lake August 1. Among the Martins and Bank Swallows were also numbers of Tree Swallows, but while the Martins remained to the 5th, the two last-named species disappeared from that locality on the day we arrived and first saw them.

Vermivora ruficapilla ruficapilla (Wils.). NASHVILLE WARBLER. August 26 a specimen was shot at the first portage above Rice Lake. On the 27th several were seen in the same locality, and on the 28th a number were observed along the Isabelle River between the first and second portages above Bald Eagle.

Wilsonia pusilla (Wils.). WILSON'S WARBLER.—August 26 a male specimen was shot at the first portage above Rice Lake.

Wilsonia canadensis (Linn.). CANADA WARBLER.—August 1 a single individual of this species was seen on the South Kawishiwi-Gabro Lake portage.

Planesticus migratorius migratorius (Linn.). ROBIN.—August 3 a single individual was seen on the south shore of Lake Gabro and on

the 5th two were seen at the first portage above Bald Eagle. None was seen thereafter.

I am indebted to the U. S. Biological Survey for verifying the identification of the following species taken several years ago:

Dendroica tigrina (Gmel.). CAPE MAY WARBLER.—July 16, 1914, a specimen was taken on the South Kawishiwi near the Gabro Lake outlet.

Dendroica castanea (Wils.). BAY-BREASTED WARBLER.—1912: a specimen was taken June 23, on the Clear Lake-North Kawishiwi portage. 1913: one was taken August 30, on the Isabelle River just above Lake Bald Eagle.

Dendroica virens (Gmel.). BLACK-THROATED GREEN WARBLER.—One specimen was taken July 16, 1914, on the South Kawishiwi River at the Gabro Lake outlet.—CHARLES E. JOHNSON, *University of Kansas, Lawrence, Kan.*

Three Important Records from Hatley, Stanstead County, Quebec. **Bartramia longicauda.** BARTRAMIAN SANDPIPER.—It is with pleasure that I am able to again record the probable breeding of this handsome species near Hatley, an example being seen in a field adjoining the roadside between Burrough's Falls and Dufferin Heights on June 24, 1920. It is just seven years since my last record was made, when a nest and set of four eggs was found on May 24, 1913 (see 'The Auk,' Vol. XXXIII, 1916, No. 1, pp. 65-66).

Oporornis philadelphia. MOURNING WARBLER.—I am indebted to my friend, Mr. L. McI. Terrill, of St. Lambert's, P. Q., for being able to add this species to my already existing list of twenty-three warblers for the neighborhood of Hatley. The bird which was a young male of a family group was secured whilst ascending Mt. Orford (2860 feet) on August 1, 1920, and later on in the day another family was observed. Mt. Orford is eighteen miles from my house as the crow flies, and lies just outside the extreme northwest corner of Stanstead County, the mountain itself being in Sherbrooke County. When I visited the locality in 1918 it struck me as being a particularly rich one, and I should not be surprised if the Black-poll Warbler is eventually found there in some numbers during the spring and fall, the birds migrating through the chain of hills extending from the State of Vermont along the western shore of Lake Memphremagog to practically the St. Francis River, by means of which latter, and the St. Lawrence River, they eventually reach their breeding grounds in the far north. The Mourning Warbler is the only new addition so far this year to my list of Hatley birds, the total of which now stands at 176 species.

Empidonax flaviventris. YELLOW-BELLIED FLYCATCHER.—It is a pleasure to be able to add this little flycatcher to my list of breeding birds, a nest and set of five eggs being found on June 14, 1920. The site was a tamarack and cedar swamp, the nest being sunk in the sphagnum moss at

the foot of a tiny sapling tamarack. It was composed outwardly of ordinary moss, whilst the lining inside consisted of fine dry grasses, the dimensions being as follows: outside diameter three, inside one and a half inches; outside depth two and a half, inside one and a half inches. It contained an extra full set of five eggs (four being the usual number) whose average dimensions were .62X.49. The notes of the male were first heard whilst searching for orchids, and after adopting the tactics as explained in my "Singing Tree" paper ('Auk,' Vol. XXXVI, 1919, No. 3, pp. 339-348) the nest was eventually found at a distance of eighteen and twenty yards respectively from the favorite singing trees of the male. With the addition of this little flycatcher my list of birds actually found breeding at Hatley now stands at 85 species, with another 15, some of which are known and others believed to breed more or less regularly, but whose nests, eggs or young have so far escaped detection.—H. MOUSLEY, *Halley, Quebec.*

Ornithological Notes from Southeastern Alaska.—In anticipation of the appearance of a new 'A. O. U. Check-List' it would seem opportune to publish the appended data for the consideration of the committee in charge. While most of this is in the nature of extension of ranges as given in the last 'Check-List,' there are included a few suggestions as to vernacular names.

Colymbus holboellii and **Colymbus auritus.**—Both of these grebes winter plentifully in the southern part of southeastern Alaska. They were common, for grebes, throughout the winter of 1919-20 at Craig, Prince of Wales Island, and at the present writing, November 11, they are common in the vicinity of Wrangell.

Gavia adamsi.—The writer knows of several unpublished records of this bird for southeastern Alaska, but, at present, is unable, for various reasons, to present all of them. He has personally met with the species on three occasions, as follows: adult bird seen at close range near Craig October 17, 1919; adult seen in outer Shakan Bay, Prince of Wales Island, September 24, 1920; and immature female taken at Wrangell, October 5, same year.

Larus argentatus and **Larus brachyrhynchus.**—Both rather common in the vicinity of Craig during the past winter, the latter being the more plentiful.

Branta canadensis occidentalis.—The vernacular name, White-cheeked Goose, being inappropriate for this bird, inasmuch as it is no more white-cheeked than are several other allied races, it is here proposed that the name be changed to the Western Goose. Its habitat should also be corrected, as there is no satisfactory record of its occurrence in California either in summer or winter. As to its subspecific validity which has recently been questioned (Figgins, 'Auk,' XXXVII, Jan., 1920, pp. 94-102), the writer, having been familiar with the bird in southeastern Alaska for several years past, and having taken numer-

ous specimens and examined a great many more, can see no reason to question its validity as a geographical race. He considers it very probable that Mr. Figgins was misled by the erroneous nature of the characters given by many authorities as distinguishing this from the other allied subspecies. It is also very possible that a lack of breeding specimens of the southeastern Alaskan bird was a contributing feature to Mr. Figgins' deductions. *Branta canadensis occidentalis* is not only a breeding bird in this part of Alaska but it remains in apparently undiminished numbers throughout the winter. It is locally known as the "native goose."

Olor columbianus.—Though the writer has not personally noted this bird in winter in this region, several undoubted records by reliable observers of its occurrence at this season have come to his attention. These all apply however, to the territory a few miles north of the Canadian boundary. Mr. Winfield Wood, at present with the U. S. Signal Corps, shot a swan from a flock of four at Essowah Lake, west side of Dall Island, in early February, 1913. The same observer took a bird from a flock of twenty at Devil's Lake, Dall Island, the middle of March following, and saw a single bird at Sulzer, Prince of Wales Island, December 26, 1916. A swan was killed by William Hughes at Howkan, Long Island, December 20, 1915, and was eaten by the family of the late Mr. W. D. McLeod.

Gallinago delicata.—Fairly common in the region during the early part of the winter, at least. Taken at Craig as late as December 7, 1919, and is still seen almost daily at Wrangell (November 11, 1920). It may, however, go farther south during the latter part of the winter, as it has not been noted by the writer during January, February or March.

Arenaria melanocephala and **Haematopus bachmani.**—Winter commonly at least as far north as Craig.

Lagopus lagopus alexandrae.—A rather common bird throughout the region, south to the extreme southern end of Dall Island. Many specimens taken on Kuiu, Prince of Wales, Hecate, Suemez, San Juan, Dall and Long Islands at different seasons of the year. Have never taken any rock ptarmigan in any of these localities and doubt their occurrence, unless on Kuiu Island which has not been thoroughly covered.

Accipiter velox.—Seen and taken frequently at Craig throughout the winter of 1919-20.

Falco sparverius sparverius.—One bird seen at close range in the town of Craig September 11, 1919. Another seen in the same locality by A. M. Bailey, U. S. Biological Survey, March 10, 1920. The writer has never been able to perceive the differences ascribed to the race *deserticola*, hence the above heading.

Glaucidium gnoma subsp. ?—A female Pygmy Owl was taken on Dall Island August 24, 1920, and a male at Wrangell October 20 following. There are also two specimens taken at Wrangell in a local collec-

tion of mounted birds. Have not yet had the opportunity of comparing these specimens with others from different localities, so am not certain as to subspecific determination.

Ceryle alcyon caurina.—As this race has been shown to occupy the entire western portion of the country, south to the southern U. S. border, it would seem fitting that it be known as the Western instead of Northwestern Kingfisher, as used in the 16th Supplement to the 'Check-List.'

Cyanocitta stelleri stelleri.—The writer can see no reason for referring the crested jay from Prince of Wales Island to the form *carlottae*. As has been pointed out by Swarth (Univ. Cal. Pub. Zool. 7: 1911, pp. 78-79), birds from this locality are identical with those occurring throughout the entire Sitkan district.

Pinicola enucleator flammula.—Not very abundant, but as common in summer as in winter. A pair was seen feeding young in a nest fifty feet up in a spruce tree on a mountainside near Cape Lookout, Dall Island, July 10, 1915.

Melospiza melodia rufina. Melospiza melodia caurina.—Both *rufina* and *caurina* were common at Craig throughout the past winter, but, at the present writing, *caurina* is the only form to be found at Wrangell. This latter place, though only about a hundred miles distant from Craig, is, by virtue of its proximity to the mainland, considerably colder.

Nannus hyemalis pacificus.—Rather common at Craig during the past winter, but apparently absent at Wrangell now, though one was seen as late as November 3.

Certhia familiaris occidentalis.—As this bird occupies a much greater range outside of California than it does in that State, would it not be more appropriate to translate its scientific name literally and let it be known as the Western Creeper.

Regulus satrapa olivaceus.—Common at Craig throughout the past winter and still plentiful at Wrangell at date of present writing. (November 11, 1920).—GEORGE WILLETT, *Wrangell, Alaska*.

A Striking Case of Adventitious Coloration.—On February 8, 1920, I spent the afternoon with my family at a point in Moraga Valley, Contra Costa County, California, some five miles, airline, northeast of Berkeley. My son Willard undertook to exercise the shotgun for the purpose of securing some specimens of local birds such as happened to be needed at the Museum. In so doing he chanced upon the interesting case now reported.

We had been hearing two Plain Titmouses in a willow thicket up a ravine, and Willard proceeded to stalk them. One was finally shot and brought to me—an object of immediate marvel. For, instead of the usual light ashy gray tone of color, its lower surface was bright yellow. The other bird was still calling from the willows and when brought to hand it, too, exhibited much yellow, though not of the intensity shown by the first. Subsequent dissection, when the two birds were made up

into study skins, showed the first to be a male and the second a female. The two thus evidently constituted a mated pair.

The process of skinning left the birds slightly reduced in vividness of yellow. Before skinning, however, comparisons were made with the plates in Ridgway's (*Color Standards*) (1912). The breast of the male was found to be strong, clear "amber yellow"; that of the female a somewhat weaker tone of the same color. In both birds the amber yellow tinged also the forehead, lores, the soles of the toes and, in faint "wash," the tail; also, in the male, the anal tuft.

A significant circumstance was that the tail of the male, which was decidedly longer than that of the female, was strongly bent to the right. This indicated that the bird had been accustomed to roost in a tree cavity of rather limited capacity, and also that in settling for the night it had habitually pivoted from right to left. Furthermore, both titmouses probably slept in the same cavity.

Various persons about the University were shown the birds before skinning. One ornithologist of some standing exclaimed: "What tropical species is that!" A frequent comment was that here was a "sure enough mutation." But also the suggestion recurred that the birds must have become discolored from some extraneous source. And pollen quickly came to mind. The microscope soon showed that the yellow coloration was indeed of an extraneous nature; great masses of pale yellow bodies adhered to the barbs of the contour portions of the feather vanes. These bodies were quite uniform in appearance, elliptical, with a groove in one side, and with the surface finely speckled or "sculptured." They measured dry about 3.6 by 6.0 micra. In water they became more nearly spherical in shape.

Appeal was then made to the botanists to see whether we did not have here a simple case of pollen-carrying by birds. Professors H. M. Hall and N. L. Gardner kindly looked into the matter. Comparisons were made with various pollens available in February—willow, alder, hazel, etc.—but nothing could be found which served to solve the problem. It was the consensus of opinion that the grains in question belonged as pollen to no plant known to the locality; but a fruitful suggestion was offered, namely, that the grains might be the spores of some fungus. Appeal was then made to Professor W. T. Horne, Plant Pathologist of the College of Agriculture. After examining the material he thought it likely that we had to do with spores of some species of slime-mould (Order Myxomycetes). Such fungi are liable to occur in great quantity after a wet period in and around rotted-out hollows of tree-trunks. This brought the matter much nearer to a satisfactory solution.

As to the role of the titmouses as spore carriers, the present case cannot be counted definitely against them. For nearly all the slime-moulds, according to Professor Horne, are non-economic in bearing, being saprophytes; in other words, these fungi gain their nourishment from wood

or other vegetable substance already dead or decaying. Our titmouses, therefore, could hardly be branded as a detriment to the oak and willow trees in which they lived, as they might have been with propriety if the spores had been found to belong to some parasitic fungus injurious to living trees.

I later sent some of the spore-laden feathers to Professor Thomas H. Macbride, of Iowa University, an authority on certain groups of fungi. Although he has tried a variety of culture media, in an attempt to germinate the spores, no hyphae have as yet appeared, and no other promising clue to more exact determination has been found. Professor Horne's diagnosis remains unchallenged. Meanwhile, after the lapse of nine months, the two skins of Plain Titmouse (*Baeolophus inornatus inornatus*) in question have faded out considerably, so that the amber yellow is pale; their "tropical look" has almost gone. Yet, by daylight, they catch the eye quickly where they lie in the series of gray-colored *inornatus*. They, and their loads of spores, constitute Nos. 40,391 and 40,392 in the bird collection of the Museum of Vertebrate Zoology.—J. GRINNELL, *Museum of Vertebrate Zoology, University of California, Berkeley, Calif.*

RECENT LITERATURE

McGregor on 'Some Features of the Philippine Ornis.'—In this admirable paper¹ Mr. McGregor gives us a very clear picture of Philippine bird life, the physical features of the islands and the tremendous modifications that human agencies have effected in them and consequently in the character and distribution of the avifauna.

The destruction of forests and the introduction of plants and trees from elsewhere constitute one of the greatest elements of change and in the Philippines as here, bird life and plant life are intimately related, and change in one means change in the other. While there is no doubt that at one time the native forest covered practically all of the islands, today it has been completely destroyed over two-thirds of the area. Two-fifths of the surface of the islands is now grass land and cultivated fields and even where the forest has been allowed to grow up it is a second growth jungle of bamboo, etc., totally unlike the tall, dark, silent, primeval woodland which was practically free from underbrush. One-half of the thousand species of plants known today from the Philippines are introduced. The effect of all this on the native bird life can readily be imagined and the average visitor to Luzon today never sees any of the primeval forest or the birds that live there.

¹ *Some Features of the Philippine Ornis with Notes on the Vegetation in Relation to the Avifauna.* By Richard C. McGregor, Ornithologist, Bureau of Science, Manila. *Philippine Journal of Science*, Vol. 16, No. 4, April, 1920, pp. 361-437, Plates 1-35.

Mr. McGregor gives us a most attractive picture of the splendid native forest with the roving bands of small birds, many species closely intermingled, which go coursing through the trees, their passing followed by absolute silence until another band appears. There are certain birds, of course, that frequent the cultivated sections but they are surprisingly few in number.

The first bird to be seen by the visitor to Manila will be the European Tree Sparrow, while the next will be an Asiatic Starling, both, of course, introduced; a rather striking parallel to what one would see in any eastern American city or in those of Europe. There are listed twenty-four others—two doves, four hawks, two owls, a roller, two bee-eaters, two cuckoos, a starling, an oriole, a Java sparrow, a finch, two wagtails, etc.—which we are told are “nearly all that can be found within several kilometers of Manila.” The remainder of the ornithology of the islands consists of forest birds and water birds. The distribution of the former is discussed by the author in considerable detail and the groups of species are correlated with the different types of forest, the pine-covered highlands, best developed in Luzon but found also on Mindoro, Negros and Mindanao, having perhaps the most interesting fauna.

In connection with distribution Steere's well-known law is discussed and a number of exceptions to it are pointed out, the affinities of the avifauna of the several islands are also considered and there is a table of the endemic species showing the presence or absence of each in the eleven groups into which the islands are arranged faunistically. The total number of species and subspecies now known from the Philippines is 639 of which 469 are endemic. In this discussion, by the way, the evil of the modern excessive generic division is very evident. In Wallace's writings as well as in those of Steere, Worcester and others, the old-time genera were of the greatest importance in discussing the relationship of island as well as continental faunas, but the finer divisions of modern taxonomy are almost useless for this purpose, the number of endemic genera in any island depending wholly upon how finely we draw our lines and much of the tabulation of Wallace would be impossible today without the use of some sort of “super-genera” that would indicate very important and obvious affinities which are totally lost sight of in present-day nomenclature.

Of economic interest is a section of the paper which discusses the food of introduced Starlings in relation to locusts and a list of fifteen of the most important locust-eating birds is given. There are minor notes on the food of fourteen other species of Philippine birds.

Thirty-five half-tone plates illustrate the different types of country and forest and add materially to the value of Mr. McGregor's excellent paper, which gives one a better idea of the character of Philippine bird life than anything that has yet appeared.—W. S.

Swarth on the Fox Sparrows.—We doubt whether the geographic races of any species of bird have ever been discussed at such length and with such painstaking detail as has been done by Mr. Swarth in his review of the Fox Sparrows.¹ About 150 pages have been devoted to setting forth the differences between the sixteen races that he recognizes, the details of their distribution, variation, etc., and discussion of the broader problems that the study has brought up.

The several new forms that Mr. Swarth has established in the course of his investigations have all been described in earlier papers and it would be idle to comment upon the accuracy of his work, without the material and the time that he has had. We may feel sure, however, that in such a piece of work as this by an author of his standing the forms recognized are valid geographic races, though of course the point as to how many of them, each one of us would deem worthy of designating by name is purely a matter of personal opinion. All this concerns only those who specialize in "speciation," as Dr. Grinnell has termed it. Suffice it to say that of the three groups of Fox Sparrows long recognized, Mr. Swarth admits two races of the *iliaca* group; six of the *unalaschensis* group, from the northwest coast strip, and eight of the *schistacea* group, from the California mountains. By using these "group" names, moreover, he gets along very well without making three separate species as we fear some would feel called upon to do. We should prefer, however, to use the group names in italics without capital initial letters since in the form in which they are printed some over-enthusiastic nomenclaturist of the future may construe them as genera.

The most important part of Mr. Swarth's study is the light which it throws upon the nature of variation exhibited by these birds and its correlation with environment and physical barriers. The northwest coast group he finds is continuously distributed along the mainland from Alaska to Puget Sound with "gradual well-defined variation from one extreme to another" with "abrupt accentuation of certain features at intervals, serving for the differentiation of the several subspecies." The author goes on, however, to show that "the dividing lines between the forms do not, to our knowledge, fall where there are physical barriers to distribution (save in *insularis*), and we do know that there are many such barriers that have no effect."

An example of the last is *Passerella iliaca townsendi* which occurs on the mainland, on islands in the Alexander archipelago, and on the Queen Charlottes, with practically no change in its characters.

The members of the *schistacea* group occupy boreal islands in the mountains separated by areas unsuited for Fox Sparrows, but curiously enough, one subspecies will occupy several of these islands which are quite as

¹ Revision of the Avian Genus *Passerella* with Special Reference to the Distribution and Migration of the Races in California. By H. S. Swarth, Univ. Calif. Publ. in Zool., Vol. 21, pp. 75-224, September 11, 1920.

widely separated from one another as they are from islands in which another form occurs.

These are the sort of facts brought out by such a study as Mr. Swarth has made, and they are the vindication of this kind of research. The mere establishment of a subspecies for the sake of proposing a new name has little to recommend it.

The discussion under each race is very full and there are frequent maps showing breeding and winter ranges together with outline cuts of bills and wings and a list of some 1600 specimens used in the study. There are several half-tones illustrating habitats and a beautiful colored plate by Allan Brooks. Attractive as is this plate, however, we think that for the purposes of such a study as this a more diagramatic plate would have been better with heads all pointed the same way so that comparisons could be more readily made.

One more thought occurs which is no reflection upon Mr. Swarth's admirable paper, and that is: could not the results have been presented more briefly and is it necessary to list every specimen used in such a study? In these days of the high cost of printing the author who can adequately express his ideas in the fewest words is setting the example that we need for it is no easy matter today to secure the publication of such a monograph as Mr. Swarth has produced.—W. S.

Griscom and Nichols on the Seaside Sparrows¹.—The authors of this paper seem to have had a much more difficult problem before them than had Mr. Swarth in the Fox Sparrows, and while they do not pretend to have settled it and have only devoted a few pages to its consideration they seem to us to have come pretty close to grasping the underlying principle which is responsible for the development of the puzzling series of forms into which the group is divided. The cropping out of dark-colored races between two of much lighter tone along the Florida and Gulf coasts, precludes any idea of a gradual change from one extreme to another, and the authors' suggestion that it is the character of the local salt marsh environment that is responsible, seems most plausible. Birds which live almost entirely in the shelter of grass or scrubby bushes must be strongly affected by the character of this vegetation, the more open bushes, admitting more light tend to produce light colored forms while denser vegetation would be likely to produce darker birds. It is indeed the problem of the dense forest and scrub growth in miniature and another illustration of the close affinity of botany and ornithology in solving evolutionary problems.

The material at the authors' command was, however, insufficient to demonstrate positively this association of environment with subspecies or to show whether or not the several forms adhere strictly to the limits

¹ A Revision of the Seaside Sparrows. By Ludlow Griscom and J. T. Nichols, Abstr. Proc. Linn. Soc. N. Y., No. 32, pp. 18-30, November 3, 1920.

of their peculiar environments or spread beyond the barriers as Mr. Swarth tells us that the Fox Sparrows do. Quite likely, however, it is some other factor that has played a part in differentiating the Fox Sparrows and not immediate physical barriers.

Messrs. Griscom and Nichols have recognized nine forms of the Seaside Sparrows, two of which, *Passerherbulus mirabilis* from Cape Sable and *P. nigrescens* from Merrit Island, Florida, are recognized as species while the others are considered as subspecies of *P. maritimus*. Two are described as new, *P. m. howelli* (p. 22), ranging along the Gulf coast of Alabama and Mississippi, and *P. m. juncicola* (p. 25), from East Goose Creek, Wakulla County, Florida.—W. S.

Silloway on the Birds of the Palisades Interstate Park.—This pamphlet,¹ intended as a guide-book to the bird life in certain sections of the Palisades Interstate Park begins with an account of its physical features and the prominent points of interest, with numerous excellent photographic illustrations. The ornithological portion consists of two annotated lists, one for the vicinity of Bear Mountain, containing sixty species; the other for the vicinity of the Guest House, with sixty-one species, both based upon field studies made during the year 1918, with a supplementary list of nineteen species added during 1919.

The annotations consist of notes on nests and breeding birds observed by the author, and some general information regarding the habits of the various species. With some of the author's statements we can hardly agree; as when he says that the Chat "is a mocking warbler, and owing to the character of its noisy imitations the hearer usually refers the calls to the species imitated and does not suspect the presence of the Chat." We think that anyone at all familiar with the notes of the Chat will recognize them instantly and will not be likely to take them for the imitation of any other species, much less be misled by them. Sometimes, too, the habits mentioned by the author as characteristic of a certain species gain unmerited importance from the fact that he omits all mention of them in writing of a closely related species. The Louisiana Water-Thrush, for instance, is described as a "walker," while there is no mention of walking in connection with the Ovenbird. The color of the back of the latter species, moreover, we should hardly describe as "brown." Much information is duplicated in the two lists and it would seem to have been better to have combined them, adding separate nominal lists, if desired, of the few species peculiar to the two regions. The reversal of the order of the species, throwing the list out of harmony with all of the modern standard works, is regrettable.

¹ Guide to the Summer Birds of the Bear Mountain and Harriman Park Sections of the Palisades Interstate Park. By P. M. Silloway, M.S., Investigator in Forest Zoology, N. Y. State College of Forestry at Syracuse University, Bull. No. II, Vol. IX, No. 21, March, 1920, pp. 1-105, numerous text cuts and map.

In spite of these minor defects, some of which may after all be merely matters of personal opinion, Mr. Silloway's little pamphlet will prove of great value to all who camp in or visit the park—and they are already numbered by the thousands—while it will also be a record of present-day conditions for comparison with those of future years.—W. S.

Witherby's 'Handbook of British Birds.'—The last part of this work¹ which we have received covers the Swifts, Nightjars, Roller, Kingfisher, Woodpeckers, Cuckoos and most of the Owls.

Among the nomenclatural points that we notice is Dr. Hartert's advocacy of the use of *Apus* for the Swift, saying that we "must suppose" that Scopoli purposely made the two names *Apus* and *Apos* different. Others, however, are privileged to take an opposite view of the matter and an arbitrary ruling is necessary, if we are to have uniformity in such cases. Such a rule we find in the A. O. U. 'Code' which regards such names as the same. On much the same grounds *Agolius* Kamp is used in place of *Cryptoglaux*, as in the 'Hand-List' of Hartert et al., but the specific name *funerea* is now used as in the A. O. U. 'Check-List.'

There is an excellent half-tone plate of Owls' heads and numerous line drawings, while the general high standard of the work is fully maintained. We congratulate the author and his associates upon the excellent progress that they are making.—W. S.

Bangs and Kennard on the Birds of Jamaica.—Messrs. Bangs and Kennard have contributed the list of birds² to the 1920 edition of 'The Handbook of Jamaica.' The list is entirely rewritten and is a distinct improvement upon the Sclater list of 1910, adding a number of species there omitted and bringing the whole subject up to date.

There are now 219 species and subspecies recorded from the island, of which, however, 26 need confirmation. Three species have been introduced, 81 are migrants or winter visitants from the north, five are summer visitors from the south, while 104 are resident—exactly half of this number, including one family (Euneornidae) and eleven genera, being endemic.

The authors seem to lack the courage of their convictions in one case of nomenclature or are anxious to secure all possible "subspecific" credit, since they propose a new name, *Charadrius vociferus ternominatus* (p. 8) for *Oxyechus vociferus rubidus* Riley, which, as they say, would be pre-occupied by *Charadrius rubidus* Gmel. if we refuse to recognize *Oxyechus* as a distinct genus. But the authors show no sign of rejecting it and hence

¹ A Practical Handbook of British Birds. Edited by H. F. Witherby. Part IX (Vol. II, pp. 1-80), September 20, 1920. Price 4s. 6d. per part.

² A List of the Birds of Jamaica. By Outram Bangs and Frederic H. Kennard. Excerpted from 'The Handbook of Jamaica,' 1920. Jamaica, 1920. pp. 1-18.

do not use their own new name. It would be sad to think that the crop of subspecies were so nearly harvested that we must needs propose names that *might* be required in various contingencies!

It is interesting to note that the two races of *Dendroica dominica* occur on the island in winter in about equal numbers and that the authors "feel certain" that the Prairie Warbler does not breed on the island as has often been claimed. We trust that the present authors' services may be again available when another edition of the 'Handbook' is to be prepared as their work has been carefully and conscientiously performed.—W. S.

McClymont's 'Essays on Early Ornithology.'—In a handsomely printed little brochure¹ of limited edition, Mr. McClymont presents six short essays on early ornithological writings under the headings: 'The Rukh of Marco Polo'; 'The Penguins and the Seals of the Angra de Sam Bras'; 'The Banda Islands and the Bandan Birds'; 'The Etymology of the Name Emu'; 'Australian Birds in 1697'; and 'New Zealand Birds in 1772.' There are three plates representing a young *Casuarus unappendiculatus* in the British Museum, a reproduction of Schiffart's plate of a Cassowary, probably *C. galeatus*, published in 1725, and a Blue-faced Gannet from a specimen in the Royal Scottish Museum.

The "ruk" (or "roc") our author concludes is a combination of a myth arising from the simourgh of the Persians and the observation of some real bird possibly a sea eagle. The name "emu" or the earlier "eme" referred to the Ceram Cassowary and it is suggested that it is a Portuguese modification of the Arabic name "neama" indicating the Cassowary. The chapter on Australian birds refers to the Dutch East Indian Company expedition in 1696 which discovered not a few of the striking birds of this continent and Mr. McClymont presents strong arguments for identifying among the species referred to in journal of the voyage; the Black-necked Swan, Cape Barren Goose, Musk Duck, and Emu. The correct identification of these very early references to birds is an attractive field of research but a difficult one, as early voyagers were not well versed in ornithology, and in attempting to describe the strange birds that they encountered they were forced to make use of the names of common European species having no affinity whatever with them. With our present knowledge of the avifauna of the countries which they visited there is, however, often some casual mention of structure or habit which gives us the clue, although there is always the possibility of the species seen in early times having become extinct.

Mr. McClymont has given us an interesting bit of ornithological history and his publishers a beautiful piece of book making.—W. S.

¹ Essays on Ornithology and Kindred Subjects. By James R. McClymont. M. A. Author of 'Pedralvarez Cabral,' 'Vicente Anes Pincon' (with three plates). London, Bernard Quaritch, Ltd., 11 Grafton Street, New Bond Street, 1920, small quarto, 1-35.

Scoville's 'Everyday Adventures.'—Under this title Mr. Scoville has published another collection of out-door sketches¹ which appeared originally in various magazines. Some like those of his earlier volume—'The Out-of-Doors Club'—describe trips afield with his children, while others, notably those from the 'Atlantic Monthly,' are more serious contributions both to literature and natural history.

Mr. Scoville has an attractive style and places his "adventures" before us in a realistic manner, while a vein of humor crops out at frequent intervals. The volume is readable and instructive and he who opens it will be likely to read it through. A notable point about our author's writings is that they chronicle the doings of birds and mammals in parts of the country which have not often been treated of by popular nature writers—the Pennsylvania mountains, both the Alleghanies and the Pocono; the New Jersey Pine Barrens and the river swamps of Delaware and Maryland. And as a result the Cardinal, the Carolina Wren and the Tufted Tit come in for the same sort of familiar treatment that the more northern New England birds have long enjoyed. It is, however, a distinctly New England bird, the Hermit Thrush, that has aroused his greatest enthusiasm, even though he has studied it in the mountains of Pennsylvania and shows that other states also have a claim to it: "In the world where that singer dwells," he writes, "there is no fret and fever of life and strife of tongues. On and on the song flowed, cool and clear. * * * It was as if the wood itself were speaking. There was in it youth and hope and spring and glories of dawns and sunsets and moonlight and the sound of the wind from far away. Again the world was young and unfallen, nor had the gates of Heaven closed. All the long-lost dreams of youth came true—while the hermit thrush sang."

Certain chapters are contributions to ornithology of no little importance, as for instance the account of the Raven's nesting in the Pennsylvania mountains. As Mr. Scoville truly says, the ornithologists who have had the privilege of looking into a Pennsylvania Raven's nest may be counted on the fingers of one hand, so that his account forms an almost unique contribution to the history of this notable bird. One who has not the key to the situation may marvel at the number of really rare birds whose nests the author has studied, but to those who recognize in "the botanist," "the banker," "the artist," etc., fellow members of the Delaware Valley Ornithological Club and the American Ornithologists' Union, upon whose trips afield Mr. Scoville has been a welcome companion, the opportunities that he has enjoyed are at once apparent.

There are a few lapses, as: the reference to Fox grapes when Chicken grapes are obviously intended (p. 33); and the statement, doubtless intended sarcastically but likely to be taken seriously, that the Philadelphia Vireo is "so named because it is never by any chance found in Philadel-

¹ *Everyday Adventures*. By Samuel Scoville, Jr. The Atlantic Monthly Press, Boston [1920]. 8vo., pp. 1-241, 24 plates. Price \$3.00.

pha." The original specimen was as a matter of fact taken in the city and a number of others have been seen or taken in subsequent years. Mr. Scoville's book is by no means limited to accounts of bird-life—the four-footed beasts, the snakes, the wild flowers, trees and stars all come in for consideration—nor is literature forgotten, and in speaking of his cabin in the Jersey pines he refers to the book shelf that is maintained there, for, says he, "no book ever tastes so well as before a great fire in the heart of the wilderness, even if the wilderness be only a few miles away." And those who love the wilderness, we might add, will have no trouble in tasting it as they peruse the pages of Mr. Scoville's little volume.—W. S.

Hudson's 'Birds of La Plata.'—The first ornithological work of W. H. Hudson was the 'Argentine Ornithology' prepared in collaboration with the late Philip Lutley Sclater, the biographies of the species with which he became acquainted during his life in La Plata being prepared by Hudson and the technical portion—synonymy etc., with brief notice of such species as had been found in the more northern provinces of Argentina, being supplied by Sclater. Owing to the very limited edition the work is usually to be found only in scientific libraries and but few of Hudson's later admirers have had an opportunity of reading these biographies. This fact alone would have warranted a new edition of the work but surprising as it may seem, in the thirty years that have intervened since the appearance of the 'Argentine Ornithology' practically nothing additional to it has appeared, so far as the life histories of the birds are concerned, and Mr. Hudson's biographies are still the best accounts of the La Plata birds that we have. This double need of a new edition has just been met by the publication of Mr. Hudson's portion of the original work with the synonyms and references to the birds of northern Argentina omitted. As the author says in the preface, the character of the work is thereby altered and a new title had to be provided and in as much as the biographies all relate to the birds of the province of La Plata it was thought proper to call it 'Birds of La Plata.'

The accounts of the various species are almost identical with those of the earlier work, most of them being reprinted verbatim, but a number of the more inconspicuous species which were not treated at length are briefly mentioned in the closing paragraph of the sketch of an allied form which demanded more detailed consideration. This together with the elimination of the species of northern Argentina has reduced the number of specific headings from 434 to 190, although the extent of the biographical portion is the same in each work. The earlier book contained twenty hand colored lithographic plates, while the present work is illustrated by twenty-two beautifully printed three-color process plates, from paintings by H. Gronvold. Only two of these latter plates, however, illustrate the same species as those of the earlier series. Of the present pictures those of the Military Starling, the Many-colored Tyrant—that little Kinglet-like Flycatcher, and the Pampas Woodpecker are perhaps the most pleasing.

Of the 190 birds whose life histories Mr. Hudson has traced for us and which comprise the most characteristic and most abundant species of the La Plata avifauna, it is interesting to note that of the eighty-five Passerine birds only forty-two are song birds, while forty-three are non-oscine. In one of our eastern United States the figures would stand 132 to nine showing the far greater proportion in La Plata of non-oscine species, notably Tyrant Flycatchers, of which there are 28, and Woodhewers with 22 species. The song birds of Mr. Hudson's country comprise 6 Thrushes, 6 Swallows, 13 Finches, 13 Troupials, 2 Wrens, a Tanager and a Pipit. The birds other than Passerine are 2 Woodpeckers, 2 Cuckoos, 2 Parrots, 2 Owls, a Hummer, a Goatsucker and a Kingfisher, 14 Hawks, a Vulture, 5 Pigeons, 4 Tinamous and a Rhea together with 56 "water birds."

The introduction contains a brief history of the work and comparison of Argentine bird-life with that of the rest of South America, besides a little personal touch describing an early incident in the author's life.

Mr. Hudson's bird biographies are delightful reading and like all of his accounts of this far away land and its wild life he manages to bring in the atmosphere of the Pampas, and as we follow his pages we are able to picture many birds in their native haunts and in all the vigor of their everyday life, which have hitherto been to us merely stuffed specimens or denizens of the cages at the Zoo. Those who have read and re-read the more recent works of Mr. Hudson will be glad of the opportunity of familiarizing themselves with this earlier product of his pen, and lovers of beautiful books will wish to add the two volumes of 'Birds of La Plata' to their libraries. The work is clearly printed in large type on extra heavy paper with broad margins and attractive title pages, while the excellence of the plates has already been referred to. It is a gratification, when a book is found worthy of reprinting, to have the work done well; and the publishers have certainly fulfilled their part in bringing out these volumes.—W. S.

New Genera by Ridgway.—It is gratifying to realize from the appearance of this little paper¹ that Mr. Ridgway is at work on the final volumes of his 'Birds of North and Middle America.' The seven new genera which he proposes are for Eagles and Rails and are for species which his researches show are to be separated from those with which they are usually associated. The differences pointed out seem however to be of unequal value and it seems unfortunate that subgenera cannot be more frequently used to indicate the lesser differences; in which case the genera would not only denote the greater differences between groups but also the relationships between minor groups.

The new names proposed by Mr. Ridgway are: *Oroaetus* (p. 1) for *Falco isidori* Des Murs; *Phaeoetus* (p. 2) for *F. limnaetus* Horsf.; *Morphnarus*

¹ Birds of La Plata. By W. H. Hudson. With twenty-two colored illustrations by H. Gronvold. J. M. Dent & Sons, Ltd., London & Toronto. New York, E. P. Dutton & Co., 1920. 2 Vols., 8vo., pp. i-xviii, 1-244; and i-x, 1-240. Edition limited to 3200 copies, 200 on large paper. Price \$15.00 net per set.

² Diagnoses of Some New Genera of Birds. By Robert Ridgway. Smithsonian Misc. Coll., Vol. 72, No. 4, Publ. 2588. December 6, 1920, pp. 1-4.

chus (p. 2) for *Leucopternus princeps*; *Pernohierax* (p. 2) for *Falco leucorrhous* Q. & G.; *Hapalocrex* (p. 3) for *Rallus flaviventris*; *Linnocrex* (p. 3) for *Porzana cinereiceps* Lawr. and *Thryocrex* (p. 4) for *Corethrura rubra* ScL. & Salv.—W. S.

Murphy on the Peruvian Guano Birds.—In the third of his series of papers¹ on 'The Seacoast and Islands of Peru,' Dr. Robert Cushman Murphy describes his trip from Callao to the Guano Islands. He also outlines the history of the Guano industry and describes its present condition, concluding with a brief account of the several birds which form the great colonies on the islands. Quoting from Dr. F. A. Lucas who visited the islands in 1869, Mr. Murphy states that even at that time they had been swept clear of guano birds and that no sign of the streaming flocks was to be seen. By the close of the nineteenth century the birds had been so reduced that it was hardly thought possible that they could be saved and the industry revived. Happily however during the past twelve years, thanks to an intelligent administration and the expert advice of two foreigners, Dr. Henry O. Forbes and Dr. Robert E. Coker, the wonderful colonies have been restored and a most valuable industry has been placed upon a permanent basis. A large number of excellent illustrations from photographs by the author accompany the account.

In another recent paper² Mr. Murphy has described the Zoological garden at Lima, Peru and presented a number of illustrations of the birds and mammals which are there exhibited.—W. S.

Dr. Shufeldt's Bibliography.—The ninth and final instalment of the list of Dr. Shufeldt's published writings³ has appeared bringing the total number of titles, up to the time of going to press, to 1565. He states, however, that his production of papers is going on as rapidly as ever, which, judging from the bibliography, means from thirty to fifty per year, so that in order to keep the list up to date he proposes to issue the first supplement about March, 1921.—W. S.

Aves in the Zoological Record—1918.—Once more we are indebted to Mr. William Lutley Selater for the compilation of this invaluable bibliography of ornithology, without which systematic work on birds would be involved in hopeless complications.⁴ The titles which he has collected number 937 as against 707 for 1917. A number of titles not available during the past few years on account of war conditions are incorporated here so that the record may eventually be complete. Ober-

¹ The Seacoast and Islands of Peru—III. By Robert Cushman Murphy. Brooklyn Museum Quarterly. October, 1920.

² The Zoological Park of Lima, Peru. By Robert Cushman Murphy. Zool. Soc. Bulletin. September, 1920.

³ Complete List of My Writings with Brief Biographical Notes. By Dr. R. W. Shufeldt. Ninth Instalment. Medical Review of Reviews, September, 1920. pp. 495-498.

⁴ Aves [in the Zoological Record]. By W. L. Selater, M.A. Vol. LV, 1918, pp. 1-75. Printed for the Zoological Society of London; sold at their House in Regent's Park, London, N. W. 8. Price 6s. October, 1920.

holser seems to head the list in the matter of number of publications with 25 titles. The full alphabetical list is followed by a subject index arranged under various headings and a systematic list of new species and genera.—W. S.

Whitman's 'Familiar Studies of Wild Birds.'—This volume¹ is primarily a collection of excellent half-tones of photographs of birds and nests taken by the author—seventy-one in number. The eighty-five pages of text, with the exception of two chapters on 'Notes from the Indiana Sand Dunes' and 'Photography of Birds,' are explanations of the plates with notes on the habits and actions of the birds that were under observation. The species treated are the Cedar Waxwing, Bronzed Grackle, Parkman's Wren, Brewer's Blackbird, Broad-tailed Hummingbird, Common Tern, Yellow Warbler, Mourning Dove, Horned Owl and Kingbird, each of which is pictured in a series of plates, while there are single views of a few others. The western species were studied at Strawberry Valley, Utah.

Mr. Whitman's pictures will prove of especial interest to those who devote themselves to out-door photography. From a scientific standpoint the study of the Broad-tailed Hummingbird is perhaps the most important, particularly the photograph and description of the stubby-billed young, black skinned and nearly naked, with only a few yellow hairs ornamenting their backs. The Grackles feeding by the water's edge are rather unique as bird pictures. We notice one unfortunate slip on page 33, where the technical name of the Rock Wren has in some way been used for Parkman's Wren. The book is exceedingly well gotten up and the plates are well printed.—W. S.

Slater and Mackworth-Praed on the Birds of the Sudan.—Messrs. W. L. Slater and C. Mackworth-Praed have been engaged in a critical study of several collections of birds from the Anglo-Egyptian Sudan, which have come into possession of the British Museum—notably those of Mr. A. L. Butler—3100 skins; and of Messrs. A. Chapman and Capt. Lynes, 1600 skins; and that of Major Cuthbert Christy. The results of their studies have been published in four instalments in 'The Ibis' from 1918 to 1920, and now appear as a bulky "separate" of 336 pages.²

The attempt has been made to include all species reliably recorded from the region under consideration and some 773 names appear in the list. The comment is wholly technical dealing with relationship, racial varia-

¹ *Familiar Studies of Wild Birds—Their Haunts and Habits.* By F. N. Whitman. With many photographs by the author. Boston, Richard G. Badgre. The Gorham Press (1920), pp. 1-85, 8vo. Price \$3.00.

² *A List of the Birds of the Anglo-Egyptian Sudan.* By W. L. Slater, M.B. O.U., and C. Mackworth-Praed, M.B.O.U. *The Ibis*, July, 1918, October, 1918, October, 1919, and October, 1920.

tion, distribution and nomenclature and in many cases all of the species or geographical races of a group are worked out, making the paper of much wider importance. Genera or species which are so monographed are the spotted-breasted Weavers (*Ploceus cucullatus*, etc.), *Estrilda astrild*, *Hypochera*, *Prinia melba*, *Serinus mosambicus*, *Poliospiza gularis*, *Passer griseus*, and its allies, *Motocilla flava*, *Cyanomitra verticalis*, *Antheptes longmari*, *Laniarius aethiopicus*, *Dryoscoptes gambensis*, *Tschagra senegala*, *Cisticola erythrops*, *Sylvietta*, *Prinia mystacea*, *Pycnonotus* (Ethiopian forms), *Phyllastrephus flavicollis*, *Elminia longicauda*, *Riparia longicauda*, *Riparia paludicola*, *Hirunda puella*, *Mesopicus goertae*, *Halcyon malimbicus*, *Eurystomus afer*, *Glareola nuchalis*, *Ptilopachus petrosus*, and *Francolinus clappertoni*. A number of new forms are proposed, most of which have been noticed from time to time in our reviews of 'The Ibis,' but the following occur in the October, 1920, instalment: *Stigmatopelia senegalensis sudanensis* (p. 832), Khartoum; *Turtur afra mearnsi* (p. 836), Meridi; *Ptilopachus petrosus bulleri* (p. 842), Buval; and *P. p. ladoensis* (p. 843), Mvolo; all of which are to be credited to the junior author, who is individually responsible for the last part.

We notice that Dr. J. C. Phillips' new Nightjar, *Caprimulgus eleanorae*, described in 'Proceedings Biol. Soc. Washington,' XXVI, 1913, p. 167, and figured in 'The Auk,' 1914, pp. 149-158, is identified with *C. trimaculatus tristigma* Rupp. on the authority of Mr. Butler. Neither of Dr. Phillips' papers, it might be added, appear in the bibliography, while the authors have misspelled the name that he proposed.

This notable contribution to African ornithology is illustrated by a colored plate of skins of *Cisticola* and a map of the Sudan. It should long be our authoritative technical work on the birds of the region.—W. S.

Mathews' 'The Birds of Australia.'—The fourth part of volume VIII, which is now before us, continues the treatment of the flycatchers, covering the genera *Poecilodryas* and *Pachycephala* and their allies. Several new genera are proposed in accordance with the author's extreme ideas upon generic subdivision: *Peneothello* (p. 185), for *Poecilodryas sigillata* DeVis.; *Pleciodyras* (p. 185), for *Megalestes albonotatus* Salv.; *Papualestes* (p. 186), for *Myiolestes cyanus* Salv.; and *Gennaeodryas* (p. 186), for *Eopsaltria placens* Ramsay. There are also several new races of *Pachycephala pectoralis* and one of *P. robusta* described.

The apparent relationship of some of the birds considered in the present part to Timaliine forms allied to *Colluricincla* is discussed, this case being a very good illustration of the intricate interrelationship of Passerine groups.—W. S.

¹ The Birds of Australia. By G. M. Mathews. Vol. VIII, No. 4, October 13, 1920. Witherby & Co., 326 High Holborn, London.

Recent Papers by Domaniewski.—A number of ornithological papers by Janusz Domaniewski, some of them dealing with new South American birds, have appeared during recent years in the 'Comptes Rendus de la Societe des Sciences de Varsovie' [Warsaw: Poland], printed in Polish with a French résumé.

In the volume for 1913, is a study of the geographic distribution of the European forms of *Sitta* in which is described *S. europaea sztolcmani* (p. 1042).

In 1915 appeared a description of a new warbler, *Sylvia communis volgensis* (p. 550) and a review of the eastern forms of *Passer montanus* with *P. m. dybowski* (p. 562) described as new.

In 1917 appears the second instalment of 'Materials for an Ornithological Fauna of Poland' the third part of which is in the 1918 volume; 'A Contribution to our Knowledge of Palaearctic Falcons', *F. subbuteo usuriensis* (p. 269) subsp. nov.; 'A Contribution to a Knowledge of the Geographic Forms of *Cerchneis naumanni*,' *C. n. sarmaticus* (p. 1044) subsp. nov.; 'On the Palaearctic Forms of *Acanthis*,' *A. linaria asiaticus* (p. 1054) subsp. nov. and a description of *Serinus canarius polonicus* (p. 995) subsp. nov.

The 1918 volume contains a review of the forms of *Grallaria* with two new forms, *G. rufula saturata* (p. 474) from San Rafael, Ecuador; and *G. r. taczanowskii* (p. 475) from Cayandedel, Ecuador; 'Notes of the Forms of *Pyriplena*' with descriptions of *P. leuconota hellmayri* (p. 179) from Chulumani, Bolivia and *P. l. marcapatensis* (p. 180) from Huaynapata, valley of the Marcapata; 'On the Geographic Forms of *Turdus viscivorus*, etc' *T. obscurus buturlini* (p. 444) subsp. nov. and 'On the Forms of *Cynchramus schoenichus*,' *C. s. curvirostris* (p. 745) and *C. s. goplanae* (p. 746) subsp. nov.—W. S.

Recent Papers on Bird Protection.—From 'Bird Notes and News' IX, No. 3, we learn of the deplorable plight of the plumage bill in Parliament, where a few agents of the millinery trade are, through methods of procrastination, defeating the obvious desire not only of their fellow members but of an overwhelming majority of the people of England.

There is also a severe arraignment of wholesale egg collecting aroused by the publicity campaign of the "Museum of Comparative Oology" at Santa Barbara, Calif.

In Bulletin 9 of the "Permanent Wild Life Protection Fund" Mr. Hornady has a report on the progress of the movement to induce land owners to forbid shooting of any kind on their estates. There are now no less than 3,131 such sanctuaries in the United States covering in all a million and a half acres. Oregon leads with over 800,000 acres and yet Oregon in a referendum vote has just declined to preserve the famous Malheur Lake bird reservation and has turned it over for land drainage and speculation. The spring 1920 bulletin of the Illinois Audubon Society is as usual an interesting and well illustrated pamphlet, containing among

other things an account of bird life at Olney by Mr. Robert Ridgway. The 'Bulletin of the American Game Protection Association' has an illustrated paper on attracting ducks and feeding them on protected bodies of water.—W. S.

The Ornithological Journals.

Bird Lore. XXII, No. 5, September-October, 1920.

The Screech Owl. By H. E. Tuttle.—Contains some valuable notes on habits. Decapitates its victims eating the head first and in the opinion of the author sees as well as a cat in the daytime.

The Tragic Story of a Titmouse. By George Roberts.—Valuable account of habits of the Tufted Titmouse.

A Hummingbird Story. By W. F. Smith.—Remarkable nesting of a Ruby-throat on the sliding block of a porch swing.

Mount Mazama Bird Notes. By L. L. Haskin.

The Tree Swallow on Long Island. By J. T. Nichols.—Nesting on the south shore and notes on field identification marks.

Dr. A. A. Allen has a popular account of how birds moult and the educational leaflet by T. Gilbert Pearson treats of the Grackles. Mr. Pearson also has an article on new bird colonies on the Texas coast and Dr. T. S. Palmer has a sketch of the late William Dutcher.

The Condor. XXII, No. 5, September-October, 1920.

The Pink-sided Junco. By M. P. Skinner.—Its life history in the Yellowstone Park.

The Function of Powder Downs in Herons. By Alexander Wetmore.—Confirms a suggestion of Newton and Gadow that these feathers secrete oily matter used in dressing the plumage. Dr. Wetmore's tame heron gave abundant opportunity to study the whole operation at very close quarters. The uropygial oil gland was not used at all by the young bird and it was found to be non-functional until the bird was practically grown.

Notes on a Few Birds of the Grand Canyon, Arizona. By M. H. Lee.

New and Interesting Records of Pribilof Island Birds. By G. Dallas Hanna.—Includes a record of *Limnocryptes gallinula* new to North America, and complete lists of the breeding birds of each of the five islands.

Notes on Some Birds of Interior Alaska. By L. R. Dice.—An annotated list of 86 species observed near Fairbanks and Tanana and on the Kuskokwim River to Bethel.

The Oologist. XXXVII, No. 9, September, 1920.

Dreams. By R. M. Barnes.—An account of the egg collection of the late R. B. Christ.

Migration Notes. By Johnson Neff.—Deals with the Ozark region of Missouri as does another note several pages beyond.

Concerning the Ornithology of the Long Expedition of 1820. By Geo. E. Osterhout.—Curiously enough the writer fails entirely to mention the

man who in all probability was the collector and discoverer of the new birds—Titian Ramsay Peale, the assistant zoologist of the expedition.

The Wilson Bulletin. XXXII, No. 3. September, 1920.

Some interesting Records of Nebraska Birds for the Year 1919. By C. E. Mickel and R. W. Dawson.—Notes on 34 species.

Notes on the Birds of the Fort Leavenworth Reservation, Kansas. By David C. Hilton.—Annotated list of 82 species.

Whip-poor-will Calls. By Dayton Stoner.—An interesting record showing a number of counts of over 300 calls with but few short intervals between the series, and one record of 710 calls with but four intervals. Doubtless many have attempted to make counts while lying in bed but the reviewer's experience with such efforts is that the monotonous repetition of the call invariably produces sleep and the count is not completed.

Birds Observed near Minco, Central Oklahoma—An Addition. By Alexander Wetmore.

The Ibis. (II Series.) II, No. 4. October, 1920.

A Nominal List of the Birds at present known to inhabit Siam. By Count Nils Gyldenstolpe (continued).

A List of the Birds of the Anglo-Egyptian Sudan. (concluded.) By W. L. Sclater and C. Mackworth-Praed.

A Contribution to the Study of Nesting Birds. By Collingwood Ingram.—This is a most important paper full of data and suggestion and should be read by everyone interested in the development of nestling birds and the true significance of their plumage and structural characters. Down feathers are classified with more accuracy than in most works on plumage and the extent of feathering in various groups of birds at hatching is discussed. The author believes that the downy covering of Passerine birds is of real service to the species possessing it and not a "functionless ancestral inheritance," and in this we are inclined to agree with him. He looks upon it as obliterative in function, and considers that its absence in birds bred in dark cavities is simply due to the lack of necessity for obliterative markings under such circumstances. He also points out that where the family of young is large and the individuals crowded closely together the down is for the most part lost except on the head, which is the only exposed part of the bird. The case of naked young in open nests he confesses is "somewhat difficult to explain," but he makes the suggestion that the dark color of the skin of the nestling, in many of such species, may serve to partly camouflage them and further that they may be more continuously brooded by the parents.

There is discussion also of the development of the flange of the gape, the "egg tooth," the tubular nostrils of the Goatsucker etc., and a table of the development of down in most of the British species of Passerine and Picarian birds.

Notes on the Birds of North-east Chihli. By J. D. D. LaTouche. Part II.

Some preliminary remarks on the Altitude of the Migratory Flight of Birds, with special reference to the Palaearctic Region. By Col. R. Meinertzhagen.—A notable contribution to this subject with a valuable collection of data obtained from aviators and other sources. His conclusions are that birds rarely occur in migration at an altitude greater than 5000 feet and that the bulk of the flight is conducted below 3000 feet. Incidentally he states his view that birds do not rely to any large extent on land marks to guide them on migration. In this we heartily agree.

British Birds. XIV, No. 4. September 1, 1920.

Notes on the Breeding Habits of the Little Tern. By Thomas Lewis.
—With excellent photographic illustrations of nesting behaviour.

The Law of Territory. By J. M. Dewar.

British Birds. XIV, No. 5. October 1, 1920.

The Haunt of the Black-tailed Godwit. By E. L. Turner.—With admirable illustrations from photographs.

Notes on the Nesting of the Nuthatch. By A. H. M. Cox.—Notes the habit of breaking off fresh leaves from twigs which concealed the nest hole from view and of plastering up the hole to suitable dimensions. A count of the pieces of bark etc. carried in for nest construction showed over 10,000.

Some Notes on Diving Ducks. By Charles E. Alford.

The Sale of the Duchess of Portland's Museum in 1786. By H. S. Gladstone.

British Birds. XIV, No. 6. November 1, 1920.

The Black Tern. By E. L. Turner—Beautifully illustrated account of nesting.

Avicultural Magazine. XI, No. 10. October, 1920.

The New Collection at Chateau de Cleres. By H. D. Astley.—M. Delacour is building up a new collection to replace his famous aviary destroyed during the war.

Avicultural Magazine. XI, No. 11. November, 1920.

Notes on the London Zoological Society's Indian Collection. By E. W. Harper—About 40 species of birds received in a shipment including a *Psaroglossa spiloptera*.

The Emu. XX, Part 1. July, 1920.

Plumage Changes of the Nankeen Night Heron (*Nycticorax caledonicus*); By C. F. Cole.—The plumages would be better understood if the nomenclature now generally adopted were used.

With Camera and Field Glasses in Northwest Victoria. By L. G. Chandler.—Illustrated by some beautiful half-tones.

Australian Species of Tubinares (Petrels and Albatrosses). By W. B. Alexander.—The first instalment of a valuable paper, in which we are gratified to see that the author makes use of subgenera instead of following the extreme generic subdivision advocated by Mathews. (continued in October number).

Penguins. By R. Stuart-Sutherland. (continued in October number).
Aboriginal Names of Birds. By E. S. Sorensen.

Discovery and Early History and Notes on the Lyre-Bird (*Menura superba*).

The Emu. XX, Part 2. October, 1920.

Notes on Additions to the "H. L. White Collection." By A. J. Campbell.

The Birds of Sydney. By A. S. Le Souef.

Food Pellets of Kingfishers. By Reg. Hays.—With photographs of contents.

Breeding of Bustards. By A. H. Chisholm.

There are some interesting photographs of *Podargus* and in both this and the preceding number, notices and comments on Mathews' latest 'List' of Australian birds.

The South Australian Ornithologist. V, Part 3, July 1, 1920.

The Birds of Rivers Murray and Darling and the District of Wentworth, Part II. By A. Chenery and A. M. Morgan.

Australia's Mockingbird. By Edwin Ashby.—The calls of the Victorian Lyre-Bird (*Menurus novae-hollandiae*.)

El Hornero. II, No. 1. July, 1920. [In Spanish.]

The Penguins of the Coasts and Islands of the Argentine seas. By Roberto Dabbene.

List of the Birds of Uruguay. By Juan Tremoleras.—254 species listed with a few recorded localities for each.

Short Notes on Antarctic Birds. By A. G. Bennett.—On the birds observed on the Shetland del Sur Islas and the Orcadas del Sur in 1913-14, 1914-15 and 1917-19 illustrated by half-tones from photographs.

The Young of the Stork (*Euxinura maguari*). By Miguel Fernandez.

Notes on Mallophaga of Argentine Birds. By F. Lahille.

On Fossil Birds of the Republic of Argentine. By Lucas Kraghevich.

Revue Francaise d'Ornithologie. No. 138. October 7, 1920. [In French.]

Guide for the Amateur Ornithologist Visiting Africa. By Dr. Millet-Horsin.

Le Gerfaut. X, No. 3. 1920. [In French.]

Remarks on the Life History of the Cuckoo. By L. Coopman.

Birds of Prey Useful or Injurious. By Ch. Groud.

Observations on the Song of Some Thrushes. By A. Mercier.—Deals with the common European species.

Ornithologische Monatsberichte. Vol. 28, No. 7-8, July-August, 1920. [In German.]

The Forms of Bird Calls. By H. Stadler and C. Schmitt.

Two New Weavers from Middle Africa. By M. Sassi.—*Ploceus (Melanopteryx) holomelas* (p. 81) *P. (M.) aureonucha* (p. 81) both from Mawambi.

Ornithologische Monatsberichte. Vol. 28, No. 9-10, September-October, 1920.

Feining of Wild Doves (*Columba palumbus*) for the protection of their Young. By F. Sellbach.

A New Crested Lark from French Guinea. By H. Grote.—*Helicorys modesta nigrita* (p. 98).

Ornithologische Monatsberichte. 1917 and 1918 are at last available for notice. The former volume contains numerous observations on the birds of northern France; discussion on the validity of *Fulica stenoleuca* Peckelhoff as distinct from *F. atra*, and an historical article on Reichenbach's 'Natural History of Birds' by A. Jacobi. The following new forms are described by O. Neumann from New Guinea: *Chaetura novae-guineae mamberana* (p. 153); *Edoliisoma schisticeps reichenowi* (p. 153); *E. s. moszkowskii* (p. 154); *E. s. bernsteini* (p. 154); *Aplonis cantorides longipennis* (p. 155).

In the 1918 volume there are additional papers on French and Russian birds; discussion on the forms of the European Creepers (*Certhia*); the sexual characters of *Bombicilla garrula* by F. Tischler and on the Corvidae of West Russia. J. Gengler describes as new *Corvus corax dardaniensis* (p. 110) from Macedonia, in the September-October issue.

Journal für Ornithologie. Vol. 65, No. 1. January, 1917. [In German.]

An Ornithological Bibliography of Pommerania. By F. Koski. (completed in April.)

Bird Migration in the Western Sahara. By H. Geyer von Schweppenburg.

The Different Methods of Recording Bird Notes. By H. Hoffmann.

Observations of the Birds of Pottsdam and the Arrival in Spring. By H. Anel.

Some African and other birds are described in the proceedings of the Ornithological Society which may date from here.

Journal für Ornithologie. Vol. 65, No. 2. April, 1917.

The Belief in the Hibernation of Birds and Its Origin. By A. Wesemüller.

Journal für Ornithologie "Sonderheft," April, 1917.

Bird Migration in Helgoland in the Years 1912 and 1913. By P. Kruss.—Daily lists with direction and strength of wind and a list of 71 species observed.

Journal für Ornithologie, Vol. 65, No. 3. July, 1917.

In the Land of the Tuareg. (Eastern Sahara.) By H. Geyer von Schweppenburg. (continued in April, 1918.)

Bird Observations at Rossiten, during 1916. By H. Thienemann.

New Birds Described by Reichenow. Page 391: *Turdus pondoensis*, Pondo-land, S. E. Africa; *Dryonastes tsinlingensis*, Schensi, E. China; *Bradypterus usambarae*, Usambara, E. Africa; *Calamocichla palustris*,

Massailand; *Cinnicerthia paramosa*, Ecuador, "Paramos Grenze"; *Turdinus tanganyicae*, Tanganika. Page 392: *Ploceus quilimanensis*, S. Mozambique; *P. epipolius*, Kilwa, E. Africa; *P. pondensis*, Pondoland.

Journal für Ornithologie, Vol. 65, No. 4. October, 1917.

New Contributions to Our Knowledge of the Birds of the Province of Posen. By J. Hammling (continued in January and April, 1918).

Remarks on Some Turkestan Birds. By P. Kollibay. (continued.)

On the Song etc., of the Swift. By B. Hoffmann.

The Geographical Races of *Turdus viscivorus* L. By F. von Lucanus.—*T. v. jubilaeus* (p. 511) susp. nov. Caucasus.

New Species described by Reichenow. *Gerygone stictilaema* (p. 514) and *Chaetura burgersi* (p. 514) both from Sepik, N. Guinea. Many of these descriptions of Dr. Reichenow are very unsatisfactory, being exceedingly brief with no mention of a type specimen.

Journal für Ornithologie. "Sonderheft," 1918.

On Bird-banding Experiments during 1913 to 1916 and Bird Migration on Helgoland, 1914-1917.

Journal für Ornithologie. Vol. 66, No. 1. January, 1918.

New Species of African Birds Described from 1905 to 1914. By A. Reichenow.—A list of 979 species and genera with reference to place of publication.

Journal für Ornithologie. Vol. 66, N. 2, April, 1918.

Contributions to the Ornithology of Macedonia. By R. Schlegel.

Queries and Problems in Bird Song. By C. Schmitt and H. Stadler.—The Nightingale, Cuckoo and Titmouse.

Journal für Ornithologie. Vol. 66, No. 3. July, 1918.

On the Ornithology of Northeast France. By W. Bachmeister and O. Kleinschmidt.

Two Years of Field Ornithology in the Rokitno Swamps [Western Russia]. By W. Graftsmann.

Journal für Ornithologie. Vol. 66, No. 4, October, 1918.

Bird Observations at Rossitten, 1917. By H. Thienemann.

Review of the Birds of Kurland. By A. Reichenow.

The Systematic Position of *Urocynchramus pylzovi* Przew. By J. Domaniewski.—A new family Urocynchramidae proposed for it as it differs materially from all of the Fringillidae, in which family it has previously been included.

Descriptions of New Birds by Reichenow.—Page 437: *Dendropicos obsoletus camerunensis*, Kamerun; *D. o. kirensis*, Kir, Africa; *Sylvietta zedlitzii*, South Kavirondo, Page 438, *S. ladoensis*, Lado; *Serinus dorso-striatus intensilinctus*, Massailand; *S. icterus songeae*, Songea; *Polio-spiza angolensis deserti*, Damaraland; *Phonygammus neumanni*, Lordberg, Sepik; Page 439: *Trichoglossus aberrans*, New Guinea.

Journal für Ornithologie. "Reichenow Festschrift." 1917. Vol. 65, pt. II. Published in commemoration of the seventieth birthday of Anton

Reichenow; comprising a sketch of the ornithologist and twenty-seven papers by members of the German Ornithological Society. Among these may be mentioned the following:

Important Observations on the Paraguayan Forest Region. By Hans von Berlepsch.

The Ornithological Position of the Tuareg Mountains. By H. Geyer von Schweppenburg.

The Biology and Distribution of our Species of *Certhia*. By W. Hagen.

The Influence of Season, Age and Sex upon Moulting. By O. Heinroth.

On the Hygienic and Economic Value of Birds. By C. R. Hennicke.

The Specific Validity, Winter Plumage and Melanism of *Uria mandtii*. By A. Jacobi.

The Owls of Egypt. By A. Koenig.

The Numerical Relation of the sexes in the Bird World. By F. von Lucanus.

On the Avifauna of the Lower Senegal Country. By O. Neumann.—With a list of 293 species.

A few Remarks on the Avifauna of Nova Zembla. By H. Schalow.

Do Migrating Birds Require Preparation for their Flights? By J. Thienemann.—Dates of arrival and remarks on the condition of the stomach and crop.

The Plumage of the Pine Crossbill (*Loxia curvirostra*), By F. Tischler. List of birds observed in the Sahara Country. By O. Graf von Zedlitz. Comment on *Turdus viscivorus jubilaeus* which here appears as "new" but with a reprint of Lucanus' earlier paper.

Aquila. 1915. XXII. [In Hungarian and German.]

(These annual numbers are full of articles dealing with the migration economic value habits and distribution of Hungarian birds with many local lists. In the following notice only the more important papers or those of more general interest are mentioned.)

Histology of the Skin of Birds. By E. Greschik.

On the Structure of the Spleen in Birds. By E. Greschik.

Bird-banding by the Hungarian Ornithological Society in 1914 and 1915. By J. Schenk.

Materials for an Avifauna of Serbia. By D. Lintea. (concluded in 1916.)

On Fossil Remains of *Bubo maximus* and *Syrhaptes paradoxus*. By K. Lambrecht.

Aquila. 1916. XXIII.

Bibliography of Palaeo-ornithology to the end of 1916. By K. Lambrecht.

Biography of Otto Finch and others.

Bibliography of Hungarian Ornithology 1915–1916. By T. Csorgey.

Aquila. 1917. XXIV.

On the Digestive Canal of *Androglossa aestiva*. By E. Greschik.

Origin and Development of the European Bird Fauna. By K. Lam-brecht.

Aquila. 1918. XXV.

The Morphology of the Tongue of Birds. By J. Greschik.

A Nomenclature of the Birds of the Kingdom of Hungary. By Stefan Chernel.—410 species listed but the nomenclature does not follow any code, the 10th or 12th edition of Linnaeus being cited for a species according to which will cause the least change in the names.

On the Digestive Canal of *Regulus cristatus*. By E. Greschik.

Aquila. 1919. XXVI. *

International Bird Protection.—The Paris convention of 1902.

Positive Data on the Food of Our Birds. By E. Csiki—Elaborate tables of food of the Magpie.

Ornithological Articles in Other Journals.¹

Soper, J. Dewey. Nesting of the Ruby-crowned Kinglet at Guelph, Ontario.—A valuable account of the species. (Canadian Field Naturalist, April, 1920.)

Townsend, Charles W. Notes on the Summer Birds of the Gaspé Peninsula, Province of Quebec. (*Ibid.*)

Clarke, W. Eagle. The Attempted Breeding of the Bee-Eater (*Merops apiaster*) in Midlothian. (Scottish Naturalist, September-October, 1920.)

Rintoul, L. J. and Baxter, E. V. The Shoveller as a Scottish Breeding Species. (*Ibid.*)

Adams, C. C., and others. Plants and Animals of Mount Marcy, New York. Part II. (Ecology, 1, July 1920.)—Bird data mostly from Eaton's 'Birds of New York.'

Allen, Elsa G. The Eggs of Birds. (American Forestry, 1920.)

Ruttledge, R. F. Some Notes on the Habits of the Wren. (Irish Naturalist, November, 1920).—Sings in every month of the year and sings on the wing.

Illidge, R. Wrens of the Brisbane District. (Queensland Naturalist, II, No. 3).

Chisholm, A. H. Courtship Among Birds. (*Ibid.*).—Comments on Lankester's statements.

Baker, E. C. Stuart. Notes on Two Collections of Birds from Seistan. (Records of the Indian Museum, XVII, Part II.)

Wait, W. E. Occurrence of the White Wagtail in Ceylon. (Spolia Zeylanica, XI, Part 42.)

* The above bring our notices of the German ornithological journals, which were not accessible during the war, up to date.

Wait, W. E. The Picarian Birds and Parrots of Ceylon. (*Ibid.*)—Description, distribution and habits with keys for identification.

Wait, W. E. The Migration of Birds and Ceylon Migrants. (*Ibid.*)—General part follows Eagle Clark, valuable local data.

Donald, C. H. The Birds of Prey of the Punjab. Part IV. (Journal of the Bombay Nat. Hist. Soc., XXVI, 1920. and XXVII).

Whistler, Hugh. Further Notes on Birds about Simla. (*Ibid.* XXVII, 1920—90 species.

Ludlow, F. Notes on the Nidification of Certain Birds of Ladak. (*Ibid.*)

Houssay, M. F. On a morphological Index of Flight in Birds. (Bull. Mus. Nat. Hist., 1919, p. 552—558.) [In French.]

Paris, P. Researches on the Life History of the Birds of the Vineyards. (Annales des Service des Epiphytes, V, 1918).—Habits and economic position of the various species. [In French.]

Giglio-Tos, E. List of the New Forms or Subspecies of Italian Birds Described up to December 31, 1915. (Boll. Mus. Zool. Anat. Comp. Torino, XXXIII, No. 727, October 15, 18, 19.) [In Italian].

Salvadori, T. On *Podiceps infuscatus* (*Ibid.* XXX, No. 694, March 4, 1915). [In Italian.]

Salvadori, T. An Eagle of Northern Africa. *Aquila occidentalis* Brehm. (*Ibid.* XXX, No. 700. April, 1915). [In Italian.]

Hess, Albert. Recent Results of Swiss Bird-banding. (Zoolog Beobachter, LXI, 1920.) [In German.]

Gengler, J. Field Notes on the Ornithology of Hungary and the Seven Mountains. (Archiv. fur Naturgesch, LXXXIV, abt. A., heft 12, 1920.) [In German.]

Sunnen, M. Ornithology of the Raven Family. (Festschrift zur Feier des 25 jahr. Bestehen. Luxemburg Soc. Nat. Hist. 1915.) [In German.]

Lonnberg, Einar. Hybrid Gulls. (Arkiv. for Zoologi, XII, No. 7. 1919.) [In English.]

Lonnberg, Einar. *Loxia hordeacea* Linn. 1758, is identical with *Euplectes flammeiceps* Sw. 1837. (*Ibid.* No. 3). [In English.]

Rendahl, H. Notes on a Collection of Birds from Panama, Costa Rica and Nicaragua. (*Ibid.* No. 8). [In English.]—Collection of 199 species made in 1882—83 by Dr. C. Bovallins. *Rynchops melanura intermedia* (p. 12) subsp. nov. San Juan del Norte, Nicaragua.

Antony, Mythilde. On the Saliva glands of Birds. (Zoolog. Jahrbucher, Abst. Anat., 41, 1919.) [In German.]

Gengler, J. A Contribution to the Ornithology of Belgium. (*Ibid* heft 10, 1920). [In German.]

Killermann, S. The Plumage of the Paradise Bird. (Naturw. Wochenschrift, XVI, 1917.) [In German.]

Freund, L. The Germ-glands and Castration in Male Birds. (*Ibid.*) [In German.]—Extensive bibliography of both subjects.

Wesemuller, A. The Migration of Our Sea Birds. (*Ibid.*) [In German.]

Sokolowsky, A. On the Body Structure and Actions of the Toucans. (Natur. heft 15-16, 1918). [In German.]

Schmidt, W. J. The Yellow Color of the Mouth in Young Birds. (Verhandl. d. Naturh. Ver. Preuss, Rheinld. u. Westfalens, 75, jahrg., 1918. pp. 169-188.)

Sydanheimo, Martti. Ornithological Notes from Tunsulassa. (Meddelander of Soc. pro Fauna et Flora Fennica, XLV, pp. 196-204.) [In Finnish.]—Migration data on 23 species, 1913 to 1919.

Baillet, M. A Physiological and Literary Review of the Voice in Animals. (Actes de l'Academie Nat. Sci. de Bordeaux, 4 ser. II.) [In French.]

Additional Publications Received.—Abstract Proceedings of the Linnaean Society of New York. No. 32, 1919-1920.

Avicultural Magazine. XI, No. 12, December, 1920.

Bird-Lore. XXII, No. 6, November-December, 1920.

British Birds. XIV, No. 7, December, 1920.

Bulletin British Ornithological Club. CCLIII and CCLIV.

Bulletin Charleston Museum. XVI, Nos. 6-7, October-November, 1920.

Bulletin Essex County Ornithologists' Club. December, 1920.

Condor, The. XXII, No. 6, November-December, 1920.

Gull, The. II, No. 10, October 1920.

Natural History. XX, No. 4, September-October, 1920.

Oiseau, L'. Nos. 9 and 10, September and October, 1920.

Ornithologische Beobachter. XVIII, No. 1, October, 1920.

Proceedings Academy of Natural Sciences, Philadelphia. LXXII, part II, May-October, 1920.

Revue Francaise d'Ornithologie. No. 139, November, 1920.

Scottish Naturalist, The. Nos. 107-108, November-December, 1920.

South Australian Ornithologist. V, part 4, October, 1920.

Zoologica. II, No. II. Eclipse Plumage in Domestic Fowl. By Lee S. Crandall.

CORRESPONDENCE

Baker's Life of Pleistocene.

EDITOR OF 'THE AUK':

In the last number of 'The Auk' there appears a note by Dr. R. W. Shufeldt, in reference to my recently published 'Life of the Pleistocene,' which calls for comment on my part. To the main criticisms of Dr. Shufeldt—as to the wisdom of omitting the references to the life of this period from areas outside of the ice sheet,—I take no exception, this being a matter of personal opinion. Dr. Shufeldt thinks I should have included them; I think I should not. The statement to which I object, and I think rightly, is this sentence which closes Dr. Shufeldt's note. "This omission is to be greatly deplored, for in such a formal work as the one here considered, the ignoring of so important a group of vertebrates as Pleistocene birds—the rarest of all fossil vertebrates—casts not a little doubt upon the thoroughness of still other subjects treated in this volume."

Some weeks ago Dr. Shufeldt, in acknowledging a copy sent to him by the author, brought up these points, and some correspondence ensued as to the reasons for omitting this, as well as other groups, from consideration. I then stated the reasons, and I had thought the matter quite well understood between us, and simply a difference of opinion. For the benefit of those who may not have access to the volume I will state my reasons for omitting all (not simply the birds, as Dr. Shufeldt's note would imply) of the records of life from the area indicated by the criticism. The subtitle to the volume reads "*as recorded in the depôts laid down by the great ice sheets.*" The part of the introduction referring to this limitation has already been stated by Dr. Shufeldt.

This limitation of the field was made advisedly before the final work was undertaken and the omissions were not due to lack of thoroughness, as the criticism would imply. The records cited by Dr. Shufeldt from Texas, North Carolina, Maryland, Nebraska, New Jersey, etc., are outside of drift deposits and cannot be used for the reasons stated.

Many of these, also, are not in Pleistocene deposits but are listed as Pliocene species, and some are from deposits that are quite problematical, and may be late Pliocene. My purpose was to record so far as possible all information available concerning life that had some definite relation to one or more of the continental ice sheets. For this purpose many thousand volumes were consulted and laboriously searched, the index being ignored because many references to life were not indexed in some of these works. It is confidently believed that all important references have been included. The references to the works of Cope, Marsh, Shufeldt, and others, have been omitted, except where they contained records of material from glaciated regions. Four such works of Cope, and a fifth

in connection with another author, are listed in my bibliography on pages 412-413.

On page 373 of my work reference is made to the Vero deposits of Florida, and Dr. Shufeldt criticises the omission of his species of birds. This reference had to do only with Man's presence in the Pleistocene period and only the mammals were listed, because these only can be used to determine the probable age of such deposits. A careful reading of this section will convince any unprejudiced person of this fact.

Objection is made to the absence of records from the Pacific Coast. If a map of the glacial period be consulted it will be seen that the ice sheet extended, in the United States, only into parts of northern Idaho and Washington. To the north it extended through British America and Alaska. A reference to Pacific Coast deposits and life is made on p. 279. So far as the writer is aware little is known concerning Pleistocene life from this territory and some records from Alaska are outside of the glacial area.

As far as the birds are concerned the writer has found no records of their remains from glacial deposits within the region of the drift sheets, excepting the one listed from Chicago and identified by Dr. Shufeldt. The absence of the remains of this class of vertebrates from the interglacial deposits indicates their rarity in Pleistocene deposits, as suggested by Dr. Shufeldt.

No apology is made by the author for the arbitrary limits set upon the area considered in the volume in question. The vertebrates of the outlying territory have been well listed by Osborn, Matthews, Shufeldt and others, and it seemed that something should be done to bring together the scattered literature relating to the territory immediately affected by the glacial ice sheets. This the author has tried to do to the best of his ability, and he wishes to make it clearly understood that this limit of area was purposely and advisedly made, that it was not due to any omissions or lack of thoroughness in preparing the work, and that as far as he has heard from many of the leading geologists and glaciologists of America, no objections such as Dr. Shufeldt suggests have been received. That there will be differences of opinion regarding interpretations made in the work is to be expected, but the writer believed that the clear statement on page iv of the introduction, in which the reasons for the limitation of the territory were carefully stated, would prevent any misconceptions or criticisms such as Dr. Shufeldt has made. The Doctor's work on fossil birds is well known to me and greatly respected and no thought of slighting or purposely ignoring his splendid work was intended in the Pleistocene volume.

FRANK COLLINS BAKER

University of Illinois, Urbana, Ill.
October 21, 1920.

NOTES AND NEWS

WALTER FAXON, a former Fellow of the American Ornithologists' Union, died at Lexington, Mass., on August 10, 1920. He was a son of Elisha and Hannah Mann Faxon, and was born in Jamaica Plain, Mass., on February 4, 1848. He spent his boyhood in Jamaica Plain, now a part of Boston, and attended the local public schools. From Harvard University he received the degrees A. B. 1871, S. B. 1872, and Sc.D. 1879. From 1874 until the time of his death he was Curator of the Invertebrate Department of the Museum of Comparative Zoology at Cambridge. He was elected to Associate Membership in the American Ornithologists' Union in 1891, and was advanced to an Active Member in 1896. He was a Fellow from 1901, when that form of membership was inaugurated, until 1904.

Walter Faxon was the youngest of a family of seven children; he had three brothers and three sisters. When the father died in 1855, the oldest son, Edwin, took his father's place in relation to the two youngest boys, Charles and Walter, the last twenty-five years his junior. His influence in directing the youthful minds of his brothers to the study of Natural History is shown in the choice of their professions; Walter became a Zoölogist and Charles a Botanist.

After leaving home for college, Walter Faxon did not return to Jamaica Plain; upon graduation he lived for a while in one of the college dormitories and then moved into the country on the western side of Boston where he lived chiefly in the towns of Arlington and Lexington. In his young manhood he made an extensive camping tour in the southern states, but he never traveled west of the Mississippi river; he visited England twice, the last time in 1900.

Walter Faxon's interest in birds began in his boyhood and remained undiminished throughout his life, a period of study covering nearly sixty years. His long experience in the field and his alertness of eye, ear and mind, as well as his scrupulous care to avoid error, combined to make him one of the best equipped and accurate of field ornithologists,—the identification of a bird by him was never questioned.

Mr. Faxon (he did not use the title pertaining to his doctor's degree) possessed also a wide knowledge of the history of Ornithology, and during the last thirty years he acquired an extensive and valuable collection of Wilsoniana, which he bequeathed to the Museum of Comparative Zoölogy. The most important contributions which Mr. Faxon made to the literature of Ornithology were two papers on Brewster's Warbler, (Mem. Mus. Comp. Zoöl., Vol. XL. Nos. 2 & 6, Jan., 1911 & Aug., 1913.) in the second one of which he demonstrated the hybrid origin of this bird. These papers were written with the pains-taking care in the choice of words and phraseology which distinguished everything Mr. Faxon wrote.

In his writings, however, he displayed the more formal side of his nature, and only those men who knew Mr. Faxon personally are aware of the delightful side of his character which he showed to his intimate friends. He was not free from the diffidence often associated with sensitive natures, and his diffidence added a little stiffness sometimes to his dignity on formal occasions, but at his home or in the field with one or two intimates, he was the happiest of companions, witty, often jovial, brilliant in conversation on a wide range of subjects. He was a charming host, and those who have been his guests will always remember the bright smile which illumined his face in welcome, and the twinkle in his eyes as he told some humorous story.

Walter Faxon was a scholar whose education rested on the firm foundation of the classics. A life of comparative leisure enabled him to make the best use of his erudite tastes and to accumulate a vast store of knowledge. In addition to the Natural Sciences, his field of interest included English Literature, notably Shakespeare, of whose work his knowledge was profound. He was also very fond of music.

Many men came to Mr. Faxon for counsel, sure of receiving careful consideration, sound advice, and intelligent, friendly sympathy, and many are grateful to him for awakening a new interest in their work and for stimulating them to better efforts.

To us who were near Mr. Faxon during the last year of his life, when he walked in the shadow of death, his quiet, patient courage will always be an example,—a courage which never gave way even when he drew his last breath. He died suddenly, as he often expressed the hope that he would do, and as two of his brothers died. He leaves behind many who respected him, many who admired him and a few who loved him deeply

W. M. T.

PROFESSOR JOHN MACOUN, M. A., F. L. S., F. R. S. C., the dean of Canadian naturalists, died at his home in Sidney, Vancouver Island, B. C., on July 18, 1920, aged a little over eighty-eight years. He had been naturalist of the Geological Survey of Canada since 1882, and resided in Ottawa until about eight years ago, when failing health made it necessary to remove to the milder climate of British Columbia. He remained actively at work, however, and up to the last months of his life was an active botanist, specializing on the mosses and fungi of British Columbia. The work of Professor John Macoun and his son, the late James M. Macoun, C. M. G., F. L. S., recently botanist and chief of the biological division, Geological Survey of Canada, built the National Herbarium of Canada from nothing up to over 100,000 specimens.

The late Professor Macoun, while best known as a botanist, was one of the old school of naturalists who took the whole field of natural science for his province. In addition to his botanical work, he gathered a collection of several thousand birds and about 2,000 mammals, with many

invertebrates and fishes, from all parts of Canada, He was an indefatigable worker and a man of indomitable will, as shown by the fact that when over eighty years of age, having suffered a partial stroke of paralysis which left his right side helpless for many months, he learned to write with his left hand and carried on his voluminous correspondence until his death.

Professor Macoun was elected an Associate of the American Ornithologists' Union in 1883. As an ornithologist his best known work was the 'Catalogue of Canadian Birds,' 1900-1904.

Professor Macoun was born near Belfast, Ireland, April 17, 1832, and came to Canada in 1850. For a number of years he taught school, retiring in 1882 when professor of natural sciences at Albert College, Belleville, Ontario, to become naturalist of the Geological Survey. Previous to this he had done more or less work for the government, joining Sir Sanford Fleming's exploratory party in 1872 at Port Arthur, and crossing the plains. From Edmonton he went with a small party through the Peace River Pass to the coast. Three years later he again crossed the continent, travelling from the Pacific coast eastward. In 1879, 1880, and 1881, he exhaustively explored the little known parts of the great northwest country, and his capable reports had a great deal to do with making known the immense potential resources of that vast territory, which is now the great grain producing region of Canada. At later periods, he worked in every province of Canada, from the Maritime Provinces to the Yukon.

In 1862 Professor Macoun married Miss Ellen Tyrrell, who survives him. He is also survived by his son, Mr. W. T. Macoun, Dominion Horticulturist, Ottawa, and three daughters. His eldest son, Mr. James M. Macoun, who was his father's assistant, died at Ottawa last January.

R. M. ANDERSON

NELSON R. WOOD, died suddenly in Washington on November 8, 1920, For many years he was employed in the taxidermical department of the United States National Museum and as a scientific and artistic taxidermist had not an equal in this country. Birds were ever the special object of his skill, and to the mounting of them for museum exhibition the greater part of his life was devoted. While a consummate master with birds of all groups, certain families were his especial favorites, such as the game birds, pigeons and fowls. Much of his work is on exhibition in the cases at the United States National Museum, and will probably be viewed for many generations to come.

Mr. Wood gained his knowledge of the normal attitudes of birds in nature through his life-long study of them in their various habitats. More than this—he had skillfully mastered the imitation of the notes and calls of a large number of birds of many species, both wild and domesticated.—R. W. S.

THE EMERSON COLLECTION OF BIRD SKINS.—Readers of 'The Auk' will be interested and pleased to learn that the California Academy of Sciences has recently acquired the entire W. Otto Emerson collection of bird skins, which numbers about 5500 specimens.

This collection is doubtless one of the most complete and valuable local collections ever made in California. Mr. Emerson began observing, collecting, and studying the birds of California some forty years ago. He very naturally gave most attention to the birds about his home Palm Cottage, near Hayward, Alameda County, Calif., but his numerous collecting trips, oft repeated, into every part of Alameda County.—the fields, the bay shore and salt marshes, the creek bottoms and ponds, the orchards, vineyards and pastures, and the canyons, hills and mountains, gave him an acquaintance with the birds of that part of California probably more intimate than that possessed by any other ornithologist. The collection is therefore particularly complete as to that territory. Many species are represented by very full series of specimens showing the differences in plumage for age, sex, and season. The series of sparrows, grosbeaks and warblers are very full. There are also several "record specimens" for California, among which may be mentioned the Redstart, Slate-colored Junco, Black and White Warbler, Black-throated Blue Warbler, White-throated Sparrow, and Harris's Sparrow.

The late Dr. James G. Cooper was for several years a near neighbor of Mr. Emerson's at Hayward, and at his death in 1902, a number of his manuscripts and notebooks were secured by Mr. Emerson, who has turned them all over to the Academy. Among these are the original manuscript of Cooper's 'California Ornithology,' 1870, and that of the 'Birds of Washington Territory,' 1860-65. The note-books or diaries date back to 1853.

It will be recalled that the J. and J. W. Mailliard collection of bird skins, nests and eggs, numbering some 25,000 specimens, was by them donated to the California Academy of Sciences in 1918. Before acquiring the Mailliard collection, the Academy was strongest in water birds. The Mailliard and Emerson additions now give the Academy a good working series of the land birds of North America.

The Academy has been able to acquire the Emerson collection of specimens and manuscripts through the generosity of two of its many public-spirited members.

Although Mr. Emerson has practically ceased collecting, his interest in bird-life continues undiminished and, with note-book and camera he continues to record his daily observations on the birds which he sees.

ERRATUM. In the notice of the meeting of the British Ornithologists' Union in the October 'Auk' an unfortunate misstatement occurs in connection with the appointment of a committee to revise the Check-List and keep it up to date. Such a committee *was* appointed. It was the proposal to place these duties on the General Committee that was rejected.

THE exhibit of ornithological art held in connection with the 38th Stated Meeting of the American Ornithologists' Union was a great success and was pronounced by various officials of the Library of Congress, in which it was held, to be the finest exhibit ever shown in the Library.

Officials of the Library were most helpful in arranging for the installation of the pictures; they also served a dinner at a special hour for the benefit of members of the Union, after which the exhibit was viewed, and the courtesy of a special inspection of the Library building and the system of handling books was extended.

In general the exhibit consisted of the work of American contributors but by the kindness of Col. Anthony R. Kuser specimens of the work of G. E. Lodge and H. Gronvold were shown, together with reproductions of pictures by these and other artists and photographers who prepared illustrations for the pheasant monograph. Etchings by George M. Benson were loaned by the Library of Congress, water colors by Miss Mary E. Eaton by the Church and Dwight Co., of New York City, and various original drawings, paintings and photographs by the Biological Survey.

Chiefly, however, the success of the exhibit was due to the cordial cooperation of the individual contributors, who assumed the risk involved in the shipment of their pictures to and from Washington, and the burden of packing and defraying expense of the incoming parcels. The total valuation of the pictures ran into many thousands of dollars. Generally speaking, each contributor was represented by six pictures, the photographs in practically every case being enlarged to 11 by 14 inches or larger.

A wide variety of birds were illustrated, the total number of 'Check-List' species being more than 180 and of foreign species 50. In general the more common birds were illustrated most frequently, pictures of the Robin being submitted by six exhibitors, of the Brown Thrasher by five, and of the Bluebird, Red-eyed Vireo, Purple Grackle, Great Horned Owl, Osprey and Wood Duck by four each.

The artists represented were: W. T. Allan, Frank W. Benson, Frank Bond, Courtenay Brandreth, Allan Cyril Brooks, H. C. Denslow, Mary Eaton, Louis Agassiz Fuertes, Carl F. Gronemann, Charles E. Heil, Frank C. Hennesey, Henry Hintermeister, Robert Bruce Horsfall, Edwin Richard Kalmbach, Charles Robert Knight, Karl Plath, Earl Lincoln Poole, Robert Ridgway, John Livzey Ridgway, Ernest Evan Thompson Seton, Edwin Sheppard, Althea Rosina Sherman, Robert J. Sim, George Miksch Sutton.

The photographers represented were: Arthur Augustus Allen, Stanley Clisby Arthur, Guy Andrew Bailey, Ernest Harold Baynes, Leverett White Brownell, Verdi Burtch, Frank Michler Chapman, Howard Henderson Cleaves, William Leon Dawson, Alexander Dawes Dubois, William Lloyd Garrison Edson, Edward Alphonso Goldman, Herbert Keightley Job, Claude Willard Leister, Robert Cushman Murphy, Jenness Richard-

son, Thomas Sadler Roberts, G. R. Salisbury, Hugo Harry Schroder, Robert Wilson Shufeldt, Henry Emerson Tuttle, Edward Royal Warren, Frank Alexander Wetmore, Frank Nunn Whitman.

The historical exhibit held in connection with that of the modern pictures comprised chiefly sets of illustrations of the Great Auk and of the Bald Eagle. The latter set was supplemented by coins, seals, coats-of-arms and other representations of eagles, conventionalized or not, used now or in the past by the Federal Government. A few of the most ancient bird pictures were also shown.—W. L. MCATEE.

THE AUK

A Quarterly Journal of Ornithology

ORGAN OF THE AMERICAN ORNITHOLOGISTS' UNION

Edited by Dr. Witmer Stone

ACADEMY OF NATURAL SCIENCES, LOGAN CIRCLE,
PHILADELPHIA, PA.

To whom all articles and communications intended for publication and all books and publications for review should be sent.

Manuscripts for leading articles must await their turn for publication if others are already on file, but they must be in the editor's hands at least six weeks before the date of issue of the number for which they are intended, and manuscripts for 'General Notes,' 'Recent Literature,' etc., not later than the first of the month preceding the date of issue of the number in which it is desired they shall appear.

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THE OFFICE OF PUBLICATION

8 WEST KING STREET, LANCASTER, PA.

Subscriptions may also be sent to the Editor, ACADEMY OF NATURAL SCIENCES, Logan Circle, Philadelphia. Foreign Subscribers may secure 'The Auk' through Witherby & Co., 326 High Holborn, London, W. C.

Subscription, \$4.00 a year. Single numbers, one dollar.

Free to Honorary Fellows, and to Fellows, Members, and Associates of the A. O. U., not in arrears for dues.

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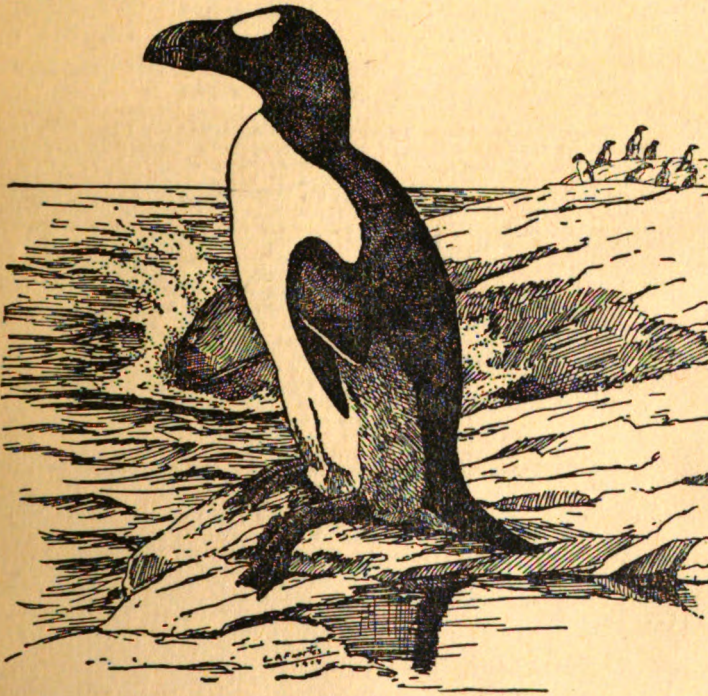
The Auk

A Quarterly Journal of Ornithology

Vol. XXXVIII

APRIL, 1921

No. 2



PUBLISHED BY

The American Ornithologists' Union

LANCASTER, PA.

10

Entered as second-class mail matter in the Post Office at Lancaster, Pa

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THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XXXVIII.

APRIL, 1921.

No. 2

THE DICKCISSEL (*SPIZA AMERICANA*) OF THE ILLINOIS PRAIRIES.

BY ALFRED O. GROSS, PH.D.

*Plates V-XIII.**(Concluded from p. 26)*

VIII. Food.

THE following account of the food of the Dickcissel is based upon an examination of the contents of the stomachs and crops of birds collected near Atwood, Illinois, and upon observations made in the field during the nesting season. The author is indebted to Mr. E. R. Kalmbach of the U. S. Biological Survey and to Mr. A. N. Caudell of the U. S. Bureau of Entomology for the identification of the crop and stomach contents of 19 of the 33 birds obtained. The stomachs were taken from birds collected chiefly in August, a season of the year when insects and seeds form the most important part of the food of the Dickcissel.

The stomachs and crops contained vegetable matter to the amount of 68 per cent, the animal food constituting only 32 per cent of the entire contents. Examinations by the U. S. Biological Survey show that 44 of 250 stomachs collected during May to August, chiefly in Kansas but some from Minnesota, Wisconsin, and Texas, contained 70 per cent animal and only 30 per cent

vegetable matter, a ratio almost the reverse of that shown by my birds. The stomachs from Illinois, excepting four specimens, were taken from young birds of the year. This fact may be correlated with the larger amount of vegetable matter in the stomachs, as young inexperienced birds are not so adept as their parents in finding or in capturing insects. It is natural to expect such birds to depend on food which is more abundant and more easily obtained than live animal matter. Seeds, the chief and practically only vegetable matter eaten, were present everywhere in limitless quantities during August, the time at which the birds were collected.

About 53 per cent of the vegetable matter or 36 per cent of the entire contents of the stomachs was made up of seeds of weeds that are of no value to man, many of which, indeed, are a nuisance to agriculture.

There were nine species of weeds represented of which two species of *Chaetochloa glauca* and *C. viridis* made up 33 per cent of the entire contents of the stomachs. *Syntherisma sanguinale* was represented by 1.6 per cent, three species of *Polygonum* (*convolvulus*, *persicaria* and *aviculare*) 0.6 per cent, while seeds of *Stellaria media* and sedge grass were present in small numbers.

Unfortunately, for the good reputation of the Dickcissel, the grain amounted to 32 per cent of the entire contents; this quantity being divided between wheat (6.5 per cent) and oats (25.5 per cent). No grain was found in the stomachs of adult birds.

The animal matter consists of insects with traces of spiders and phalangids. The large number of Orthoptera found in the stomachs (28 per cent) and the fact that at least traces of grasshoppers were found in all stomachs except one maintain the reputation the Dickcissel holds as a destroyer of these insects. The Orthoptera found all belong to two families: the Acrididae, which comprised 26 per cent, and the Locustidae, which were present in the amount of only 2 per cent of the entire contents. Species of *Melanopus* were the commonest grasshoppers found in the stomachs. A cricket, *Nemobius fasciatus*, was taken from the beak of an adult bird.

The Lepidoptera, chiefly caterpillars, amounted to 3 per cent, the Coleoptera, though represented by traces of eight or more

species, were in amounts (0.2 per cent) too small to be of great importance. There were traces of two flies, two species of ants and an Ichneumon fly, all in small quantities.

The results of the examination of the stomach contents are clearly in favor of the Dickcissel. It is true that 32 per cent of the food examined was grain, but this is counterbalanced by the 36 per cent of weed seeds. In addition, there stands in the credit column of the Dickcissel 32 per cent of insects, mostly the destructive grasshoppers. In regard to the grain, it is important to note that the stomachs were taken at a time when the oats and wheat had been removed from the fields for threshing. It is probable the grain eaten represents a waste product. But more might have been eaten if examination had been made before harvesting. The small amount of grain which I have seen Dickcissels eat in the field before harvest time was taken from heads or panicles which were lying on the ground, a product which cannot be gathered by the binder and therefore is classed as waste.

The results obtained from the examination of the stomach contents give us much that is interesting regarding the food of the Dickcissel, but they are not all the evidence in the case of the Dickcissel versus man. The daily observations made at the nests when the young were being fed deserve an equal amount of consideration. It is not until we consider the feeding habits during the nesting season that the Dickcissel receives the full credit it deserves as a destroyer of insects, especially grasshoppers.

The first food delivered to the newly hatched Dickcissels were small green Lepidopterous larvae; sometimes soft-bodied, winged insects were the first bits of food to be received by the young. Though scores of these larvae and insects were delivered by the adult birds there were very few present in the stomach contents of the adult birds examined. One female made regular trips every few minutes to an elm tree from which she was obtaining bright green caterpillars two to three centimeters in length the species of which I was unable to determine. It is probable that these caterpillars constituted as much as 90 per cent of the food of the young birds during the first two days of their existence. When under observation the female made an average of ten trips an hour which means, if this average was maintained, that these

nestlings were indirectly responsible for the destruction of more than one hundred larvae during a single day. On the third and fourth days other insects were added to the diet of the young. There were a number of aphids, a few winged insects which could not be identified, and a considerable number of small grasshopper nymphs. With this addition of other insects there was, of course a correspondingly smaller number of caterpillars eaten.

From the fifth day until the young left the nest four days later, the food was practically all grasshopper nymphs and adults. These grasshoppers were taken from a nearby clover field which was being overrun by them. Many of the clover stems were, stripped of their leaves by the ravages of these insects. During the last days spent by the young in the nest, grasshoppers were delivered at the rate of one every three or four minutes. A conservative estimate shows that about two hundred grasshoppers were eaten each day by the two adult birds and their four young. If each Dickcissel family in Illinois averaged as well as did these birds, then the more than a million Dickcissels destroyed about 100,000,000 grasshoppers in a single day during this period of the nesting season. If each grasshopper according to an estimate made by Professor Lawrence Bruner, entomologist of the Nebraska Experiment Station, eats about one and a half times its own weight or about .05 ounces of grass per day, then a hundred million grasshoppers destroy about 156 tons. The price of hay during the summer of 1918 was about thirty dollars per ton. Hence the Dickcissels of Illinois during the active period of the nesting season save the state about \$4,680.00 daily by the destruction of grasshoppers alone. These figures have a meaning which no one can fail to understand. Though the great value of these birds may not be fully known to the average farmer, the Dickcissel, nevertheless, is a favorite with many of them. No farmer wantonly destroys these birds nor does he willingly permit anyone else to do so. With such a strong popular sentiment already in their favor the Dickcissels are destined to continue their great increase in numbers.

IX. LIFE HISTORY.

A.—The Nest.

In Central Illinois the first nests of the Dickcissel may be found during the last week of May, soon after the bulk of the individuals have arrived at their summer haunts. The author's earliest record is of a nest found May 22, 1899, in a meadow of clover and timothy near Atwood, Illinois. The earliest nest reported by Mr. I. E. Hess at Philo, Illinois, is one with five eggs, found May 31, 1896. Mr. T. E. Musselman, of Quincy, Illinois, found a nest and four eggs near a putting green on the Quincy Golf links as early as May 21, 1918. Though nests are not uncommon in May, the Dickcissel does not reach the height of its nesting season until June and July. At this time practically every meadow in central Illinois has several pairs of these interesting birds. The latest record reported by Mr. Hess is that of a nest with four eggs found August 1, 1898, near Philo. On August 12, 1918, the author found a nest with four eggs in a clover field near Atwood; this is the latest record I have of a nest containing eggs. (Plate I, Fig. b.)

The usual and most typical location for the nest of the Dickcissel in Central Illinois is in a thick growth of grass or other low dense vegetation. The nest, if not placed where there is a natural depression of the earth, is supported but a few inches above the ground. It is usually so well hidden by the rank growth of clover, grass or weeds that great effort is often required to locate it. Meadows provide the larger number of nesting sites, but the Dickcissel is by no means confined to them, for it sometimes selects a very different place which may be remote from clover and grass fields. The following list of situations containing nests of the Dickcissel, which came under my direct observation, reveals the diversity in choice which may be exhibited by different individuals.

As the table shows the largest number of nests were found in the meadows or in places containing vegetation approaching that present in the clover or grass fields. About an eighth of the nests observed were in situations radically different from that ordinarily found in the meadows. Of these ten nests, all except

two were found late in the season and probably represented a second attempt at nesting, after the mowers and reapers had exacted their toll of nests from the meadows and grain fields. One of the nests found in a thorn bush early in the season was undoubtedly so placed because of the wet, swampy condition of the ground at that time of year. The nests located in shrubs and trees were at various heights ranging from about two feet to a little more than six feet from the ground, the highest having been found in a tall hedge. Though nests are sometimes placed at considerable distances from the ground, these do not represent a typical or usual situation for the Dickcissel.

TABLE XI.

LOCATIONS OF DICKCISSEL NESTS.

Classification of situations	number of nests (containing eggs or young) found
A. Meadows or situations resembling meadows.	
1. Meadows	
Clover.....	28
Timothy and other grasses.....	17
Alfalfa.....	5
2. Weeds and grass along fences or between cultivated fields.....	8
3. Wheat and clover.....	2
4. Weeds and grass along roadsides.....	2
5. Wild roses or vines growing among grass and weeds	6
	—
Total	68
B. Situations radically different from conditions found in meadows.	
1. Hedge fences (osage orange).....	5
2. Scrub apple tree.....	2
3. Thorn bush.....	2
4. Small crabapple tree.....	1
	—
Total	10
	—
Grand Total	78

The nests are somewhat crude in general appearance, but, nevertheless, are substantial structures (Plates I and IV). There is little variation in size or shape, the average measurements of ten typical nests being as follows—outside diameter 12.2 cm., inside diameter 6 cm. by 6.8 cm., outside depth 6.3 cm., inside depth 4.6 cm. The materials used seem to be those which are near at hand and, as a consequence, the composition varies according to the building material available in the immediate surroundings. Though the nests are firm and well made, those built above ground are often so insecurely attached to their support that the least disturbance may dislodge them. Two nests which were under daily observation had to be firmly tied to the vines in which they were built in order to prevent an untimely ending of the young birds.

One nest was found in the process of construction. In this case the female gathered all of the materials and performed all the work of constructing and shaping the nest. All that the male contributed was his song, which perhaps served as a source of encouragement to his mate. The nest was completed in four days and two days later the first egg was laid.

B.—The Eggs.

The eggs of the Dickcissel are pale blue, similar to those of the Bluebird (*Sialia s. sialis* (Linn.)). The average measurements and weight of twenty eggs are as follows:

Average long diameter	2.13 cm.
Average short diameter	1.61 cm.
Average weight	2.76 grams.

The number of eggs in a set varies from three to five, but four is the usual number. Out of twenty-nine nests containing eggs, five had three eggs, eighteen had four and six had five eggs each. Three of the five nests containing only three eggs were under daily observation and no more eggs were added but one or more eggs may have been destroyed before observations were begun.

A large number of sterile eggs were found during the course of these studies. Six out of eleven nests, studied during the summer of 1918, contained one or more sterile eggs. In each of four of

the six nests there was one sterile egg, in another there were two and in the sixth only one egg out of the five proved to be fertile. It was thought possible that the eggs had been chilled or that the embryo had been otherwise killed, but an examination of the contents of the unhatched eggs proved that development had never been initiated or at least had not proceeded to an appreciable degree.

Unfortunately, the exact time required for incubation was not ascertained, since the only nests in which the dates of the laying of the eggs were known were destroyed by some animal, presumably a skunk. One of the eggs of a nest containing three apparently freshly laid eggs which was first seen July 1, hatched during the morning of July 11. Consequently, at least ten to eleven days, and possibly more, are required for incubation. When the embryo is fully developed and ready to emerge the egg shell and membranes break around the entire circumference midway between the blunt and more pointed ends. The break seems to be made by the exertions of the struggling embryo to straighten its neck and to extend its legs in an effort to free itself. After the egg is cracked (Plate IV, fig. a), it is a matter of only a few minutes before the young entirely frees itself. A freshly hatched Dickcissel is anything but a handsome creature (Plate V, fig. a). At this time it is naked except for the patches of natal down, which, when wet and matted, are practically negligible as a covering.

C.—Natal Plumage.

The natal plumage, or down, of the Dickcissel when dry is pure white, there being no traces of the brown or gray tinges so commonly seen in the down of other passerine birds.

There are twelve distinct tracts or areas of down found on the upper surface of the bird as follows,—three small areas located on the dorsal-posterior part of the head, 1 median, 2 lateral, which collectively may be known as a head tract; one tract on each scapular region; two smaller tracts on the dorsal side of each wing; one elongated tract in the mid-dorsal line and one shorter tract on each side running parallel to the mid-dorsal tract. There is no down on the ventral aspect of the body, the entire underparts being naked until the juvenal plumage appears.

The natal down is retained throughout the period the young remain in the nest; sometimes parts of it persist after the young have left the nest for several days, as filaments at the apices of the feathers of the juvenal plumage. The postnatal moult is usually completed at about the ninth to the twelfth day after hatching, or one to three days after the young leave the nest. (Plate VII, fig. c.)

D.—Juvenal Plumage

The first feather papillae of the juvenal plumage to appear are those of the primaries and secondaries (alar or wing tract), which protrude through the epidermis of the wing on the second day after hatching (Plate V, fig. c). All the other tracts both dorsal and ventral are well defined by protruding papillae at the end of the fourth day (Plate VI, fig. a). Those of the head tract and caudal or tail tract are the last to appear.

The growth of the feather papillae is extremely rapid and by the end of the sixth day those of the alar tract begin to unsheath at the outer tips (Plate VI, figs. b and c.). The unsheathing of the feathers now progresses very rapidly and by the end of the tenth day the exposed tips of nearly all the contour feathers are unsheathed (Plate VII, fig. c.). The time of appearance and the rate of growth of the feathers of the various tracts are shown in Table XII.

The table of measurements is one of a series of tables made for each of eighteen fledgelings representing five different broods. This table was selected because it is typical of the series and is more complete than the others for the period following the time after the young had left the nest. The fledgeling from which the measurements were taken left the nest eight days after hatching, but was found on each of the six succeeding days, thus enabling me to make, as far as I know, the most complete series of measurements on record of a wild passerine bird living in nature under normal conditions. This Dickcissel, having been seen and handled so many times, became an intimate friend, and it was a cause of no little regret to the author that it failed to appear after the measurements and pictures were taken on August 1, 1918. The measurements of a bird eighteen days old, also given in the

TABLE XII.

WEIGHTS IN GRAMS AND MEASUREMENTS IN CENTIMETERS OF DICKCISSEL NESTLING No. 1 FROM THE DAY IT HATCHED UNTIL IT WAS FOURTEEN DAYS OLD. THIS BIRD IS SHOWN IN THE REPRODUCTIONS GIVEN IN PLATES V TO IX INCLUSIVE. THE BIRD EIGHTEEN DAYS OLD (PLATE X) IS FROM ANOTHER BROOD.

	Time spent in the nest										Out of the nest							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Days old.....																		
Bill.....	.38	.65	.80	.85	.90	.93	.98	1.0	1.04	1.12	1.12	1.14	1.15	1.15	1.25			
Wing.....	.8	1.2	1.6	2.3	3.0	3.6	3.7	4.2	4.4	4.7	4.9	5.2	5.8	6.0	6.7			
Length.....	3.8	4.6	5.3	6.2	6.7	7.3	7.5	7.6	8.0	8.4	8.9	9.2	10.0	10.5	13.3			
Tail.....	-	-	-	.01	.06	.25	.35	.40	.45	.50	.60	.95	1.3	1.5	3.8			
Extent.....	3.4	4.9	6.1	9.5	11.6	14.4	16.1	17.0	17.4	18.5	19.6	20.4	21.0	21.8	22.8			
Tarsus with middle toe.....	1.6	2.0	2.7	3.5	3.8	4.0	4.2	4.4	4.5	4.5	4.5	4.5	4.6	4.6	4.6			
3rd or front middle toenail.....	.15	.20	.29	.30	.40	.42	.43	.44	.46	.48	.50	.50	.50	.50	.52			
1st or hind toenail.....	.19	.28	.35	.48	.50	.52	.55	.56	.59	.62	.65	.68	.68	.68	.70			
6th Primary.....	-	-	.2	.29	1.5	2.2	2.4	2.5	2.7	3.0	3.5	3.7	4.2	4.4	4.8			
2nd Secondary.....	-	-	.3	.8	1.3	1.8	2.2	2.3	2.3	2.7	3.0	3.3	3.7	3.8	4.4			
Papillae or feathers of ventral tract.....	-	-	-	.24	.32	.40	.55	.76	.95	1.00	1.12	1.22	1.25	1.25	1.50			
Of dorsal tract.....	-	-	-	.20	.34	.48	.70	1.18	1.39	1.48	1.52	1.57	1.60	1.65	1.70			
Of head tract.....	-	-	-	.05	.09	.12	.28	.55	.60	.60	.61	.61	.62	.63	.68			
Weight in grams.....	2.8	4.7	7.2	10.3	11.7	13.0	15.7	18.0	18.5	18.8	19.1	20.3	21.9	22.5	26.6			

above table were made from a marked young of another brood in which the complete history was known up to the ninth day, the time it left the nest. The measurements of this eighteen-day-old bird up to the ninth day are similar in all essentials to those shown in Plates V-IX made at the corresponding ages.

Table XIII, compiled from the measurements given in Table XII, is helpful in comparing the average growth per day of the young made during different periods of time.

TABLE XIII.

AVERAGE GROWTH PER DAY OF YOUNG DICKCISSEL IN CENTIMETERS AND GRAMS.

	Average growth per day for 1st 8 days (In nest).	Average growth per day from 8th to 18th day (out of nest).	Average growth per day for 18 days.
Bill.....	.077 cm.	.025 cm.	.048 cm.
Wing.....	.425	.250	.328
Length.....	.475	.570	.528
Tail.....	.078	.335	.247
Extent.....	1.700	.580	1.080
Tarsus with middle toe...	.350	.010	.167
Third or front middle toe- nail.....	.035	.008	.020
First or hind middle toe- nail.....	.046	.011	.028
Sixth primary.....	.383	.230	.290
Second secondary.....	.333	.110	.259
Papillae or feathers of the ventral tract.....	.104	.055	.084
Papillae or feathers of the dorsal tract.....	.196	.031	.100
Papillae or feathers of the head tract.....	.100	.013	.042
Weight.....	1.900 gms.	.810 gms.	1.322 gms.

An examination of the above table at once reveals the fact that the growth of such parts as the tarsus and nails is practically completed by the time the young leave the nest: whereas, the tail, which is more than fifteen centimeters long in the adult, is less than one half of a centimeter in length at this time. The period required for development is closely correlated with the time at

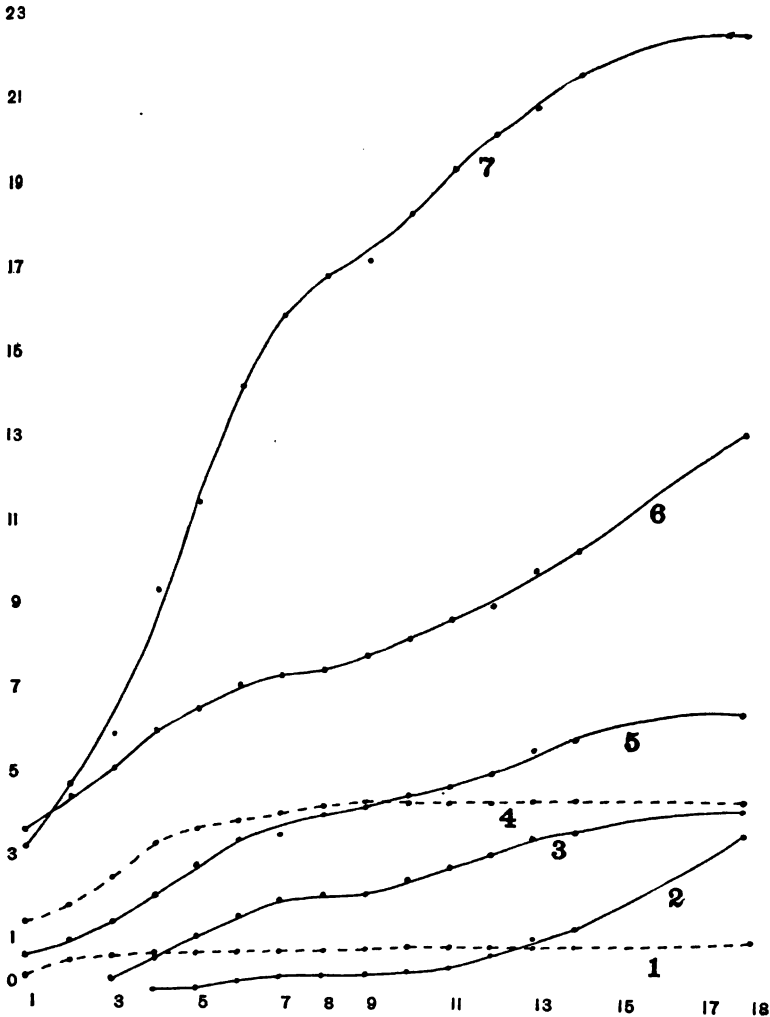
which the bird acquires the use of the respective parts. The legs and toes are called upon to serve the bird the moment it leaps from the nest, whereas a long tail would be a nuisance in the crowded nest and is not at all essential until flight is attempted. The relations of growth to the age of the bird are well shown in the accompanying curves representing growth of parts of young Dickcissel, plotted from data contained in Table XII. The numbers on the abscissa represent days and those on the ordinate indicate the units of growth in centimeters. The curves represent the growth made by the following parts respectively: 1. bill; 2. tail; 3. second secondary; 4. tarsus with toe; 5. wing; 6. length and 7. extent. It will be noticed that in nearly all cases growth was slightly retarded, represented by a dip in the curve, at the eighth day, the time this bird left the nest.

The weight of the young Dickcissel while in the nest increases at the rate of almost two grams per day, but it is less than half that amount for the few days after it leaves the nest. In one extreme case the bird lost in weight; evidently it either received less food or else expended it in energy, probably the latter.

The young of the Dickcissel leaves the nest on the eighth to the tenth day after hatching. From five nests under daily observation two of the broods left at the end of eight and nine days respectively (one or more eggs hatching a day later than the others); two broods left on the ninth day; and of a fifth brood of four young, three disappeared on the eighth day, and one remained in the nest until ten days old.

Each of the eighteen Dickcissel nestlings of the five broods noted above was tagged with a number in the hope that it might be again captured for further study during the same season or in some subsequent year. Many of the birds were seen from one to six days after they left the nest, thus making it possible to obtain complete and consecutive measurements, descriptions and photographs of the young for nearly a week after they had left the nest. The young, though often at a considerable distance from the nest, were easily located by watching the feeding operations of the mother. It became increasingly difficult, however, to find them as they acquired the ability to fly or to run quickly through the grass and weeds. A tagged bird eighteen

days old (Plate X, figs. a. and b.) was collected in a field a mile away from its home, an incident which helps explain the difficulty in securing the older stages of the young tagged birds. An attempt



was made to study one brood by tying one end of a string to the leg of the nestling and the other to the base of a weed stalk. The

female continued to feed the young as if they were free. That they grew and flourished is evidenced by the daily increase in weights and measurements. All three birds of this brood, however, either escaped or were taken by some animal during the night of the fifth day. Since this method gave the birds but a small chance against natural enemies, such as the cat and skunk, and since it was at best abnormal, it was not repeated.

At the time the young Dickcissel leaves the nest the natal down is a conspicuous element in the contour of the juvenal plumage (Plate VII, fig. b.). These downy tufts, which are attached to the apices of the feathers, are, however, soon worn off after the young begins an active life among the tangled grasses and weeds of the meadow (Plate VII, fig. c.).

The following description of the juvenal plumage is based on a study of the young at about the time the latter leave the nest. As in the case of the descriptions of the adults, the colors were determined by means of Ridgway's 'Color Standards and Nomenclature.' The numbers and letters following the color names correspond respectively to Ridgway's color, hue number, and tone. While considerable care was exercised in comparing these colors, they are at best merely approximations.

The upper parts buffy brown (17''i) shading to sepia (17''m) on the crown; feathers of the back fuscous-black (13'''m) edged and tipped with cinnamon-buff (17''b); unsheathed parts of primaries and secondaries mouse gray (15''''k) to chaetura black (17''''m) narrowly margined with pallid neutral gray (67''''f); wing coverts olivaceous black (3) (23''''m) with broad margins of cream color (19'f); edge of wings, superciliary and malar stripes light ochraceous-buff (15'b), but in some of the younger fledgelings these parts approach an orange-buff (15d) and even a deep chrome (17b) in color; chin and lower breast light buff (17'f) shading to a lighter tint on the belly; breast and upper portion of flanks chamois (19'b), but in the younger specimens in which the feathers of the ventral tracts have just unsheathed and before they have been exposed to strong light the breast approaches buff-yellow (19d) in color. None of the birds of this age have black streaks in the feathers of the breast; the beak and legs are pale flesh color (7'f), but these parts become darker as

the bird grows older. Although the young Dickcissel is unable to fly at the time it leaves the nest, it acquires the ability very quickly and within two or three days, when the bird is about 11 days old (Plate VIII, figs. a. and b.), it is able to go from 100 to 150 feet in a single flight. This distance was sometimes exceeded in test flights when the bird was given the advantage of a start from an elevated perch.

The Dickcissel undergoes several changes by the fourteenth day. The natal down is entirely lost in all individuals of this age, and even earlier if the birds are allowed to live a normal life in the grass fields. The general coloration of this stage of the juvenal plumage is similar to that of the bird eight or nine days old, but is duller in tone. There is none of the rich ochraceous-buff which is so conspicuous in the recently unsheathed feathers. This change in color is not brought about by a moult, but apparently is due to a chemical change caused by either light or exposure to air or both. The unsheathing of the feathers in a Dickcissel 14 days old is so far advanced that from a casual examination of the contour it seems complete. Many of the feathers, however, such as the primaries and secondaries of the alar tract, still retain a portion of their sheaths (Plate IX, fig. b.). This unsheathing proceeds slowly; even in a bird 18 days old, the outer primaries are not completely freed of their envelopes (Plate X, fig. b.).

The dorsal plumage of an eighteen day old Dickcissel (Plate X, fig. a) is very similar in coloration to that found in the bird fourteen days old described above. The ventral aspect of the older bird, however, differs from the younger as follows,—bordering the sides of the throat in the older bird are two well defined fuscous malar stripes, which extend posteriorly towards the breast. The sides of the chamois colored breast are distinctly streaked with fuscous. In the center of the breast, many of the feathers have narrow but distinct median fuscous stripes, all of which, at the age of eighteen days, are completely concealed from view by the overlapping tips of the feathers. A close examination of the breast region reveals other similarly marked feathers in various stages of development. These new feathers are representatives of the first winter plumage and are destined to replace those of the juvenal phase. The feathers of the breast of the birds in

the first winter plumage differ from those of birds in the juvenal stage not only in color but also in having a coarser texture. The transition from the juvenal to the first winter plumage is not so sharply defined, however, as the change from the nuptial to the adult winter plumage, which involves a complete post-nuptial moult. In the former there is only a partial post-juvenal moult, which occurs so gradually that it is difficult to say at what age the juvenal plumage ends and the first winter plumage begins.

Birds in the transitional states between the juvenal and first winter plumages were collected during the last week of June and the first week of August; representatives of the first and second broods, respectively.

A study of specimens, collected during various times of the summer, leads me to believe that the transition from the juvenal to the first winter plumage is a more prolonged process in birds of the first brood than it is in those reared late in the season. No young birds were found in the completed first winter plumage before the last week of July. At this time, though it was possible to obtain a graded series of birds from the juvenal to the first winter plumage, there was a predominance of two types of young: those with the completed first winter plumage and those still in the juvenal stage having few or no feathers of the winter plumage fully developed. This condition substantiates the statements that two broods are reared during each nesting season.

The post-juvenal moult, which includes all but the primaries, secondaries and rectrices, is well advanced in young birds five to eight weeks old, but not nearly all the feathers of the first winter plumage are fully developed by this time.

The following description is based on 5 birds (Plate XI, fig. a) ranging from 5 to about 8 weeks old. (The names of the colors used in the description were determined like the preceding with the aid of Ridgway's standards).

Males and females are similar in coloration. Crown, back and sides of the neck and rump buffy brown (17'''i) or olive-brown (17'''k); crown streaked with fuscous-black (13'''m); back snuff brown (15''k) and light clay color (17''a), the feathers with large-conspicuous streaks of black. Primaries, secondaries and tail feathers as described in the juvenal plumage. Greater and lesser

wing coverts and tertiaries fuscous-black (13'''m) broadly margined with sayal brown (15'i), but in some specimens the coverts are edged with tawny (13'i); edge of the wing and line over the eye yellow ocher (17'a); auriculars, breast and flanks buffy brown (17'''i); breast and flanks streaked with black; throat and chin cartridge buff (19''f) margined by malar streaks or stripes of black; broad short maize yellow (19f) bands lateral to the black malar stripes; lower breast and belly light cream color (19'f); unstreaked crissum or under tail coverts light buff (17'f).

In young birds estimated to be more than eight weeks old, (Plate XI, fig. b), in which the first winter plumage is practically complete the following changes are to be noted. The yellow of the bend of the wing, malar and superciliary stripes more extensive and approaches a buff-yellow (19d) tint; throat warm buff (17'd); breast empire yellow (21b) or light orange-yellow. In some specimens a yellow wash extends down to the region of the belly. In one female and one male bird there was a small obscured patch of chestnut brown which sharply divided the buff of the throat and the yellow of the breast (specimens 62 and 77, Plate XI, fig. b). The lesser and greater wing coverts vary from cinnamon-rufous (11'i); to bay (7m). The streaks of the breast not as conspicuous as in younger birds. In all other respects the older birds of the first winter plumage are similar to those five to eight weeks old.

Some of the young are partially dependent on the adults for food up to the time they have attained the full first winter plumage. I have often seen females at the roosts feeding young in the most advanced stages of the winter plumage. In this way the family groups retain their identity even after the birds are congregated in immense flocks preceding their migration to the south.

ADDITIONAL DATA

RELATIVE TO BIRDS SHOWN IN THE PLATES.

Of the two nests shown in Plate I, the upper one was located in a timothy field and was made up entirely of dried grass stems; the stems on the outside were coarser than those comprising the lining. The base of the nest rested upon leaves and dried grasses, which formed the natural covering of the ground. The dew-berry vine growing up over the nest

afforded excellent protection from the hot rays of the sun and from the violent rain storms. These vines are very abundant in the fields of southern Illinois, where they are often utilized by birds not only for nesting sites but also for food. In the vines a few yards distant from this nest were two nests of the Field Sparrow containing young. The other nest was in a second growth clover field and constituted the latest record I have of a nest containing eggs (August 12, 1918). It was made of corn husks and rootlets, remnants from the corn grown in the same field during the preceding year. The upper nest shown in Plate III, was located among the weeds of fallow ground and was made chiefly of roots with a few coarse grasses on the upper rim. This nest was supported about eight inches above the ground by tall weed stalks. The second nest was built about five feet above ground in a thick cluster of wild grape vines which were clinging to a number of small trees. It was composed of stems of weeds and grass, corn husks, grape bark and leaves, all of which were materials present in abundance on the ground near the nest. The Dickcissel utilizes whatever is close at hand and seldom, if ever, goes any great distance for its nesting materials.

This nest later became so badly infested with mites that the young were almost killed by them. The same mites, though less abundant, were found in a large number of nests. The mite according to Nathan Banks of the Museum of Comparative Zoology is probably a new species of *Liponyssus* allied to the common poultry mite.

Plate IV, figure a shows a nest and four eggs of the Dickcissel found July 15, 1918, in the tall weeds and grass along a public road near Atwood, Douglas County, Illinois. The picture as here reproduced shows the nest as it appeared on July 17, when one of the embryos was in the act of breaking the shell. This Dickcissel home furnished many of the notes used in the discussion of behavior in the sixth chapter of this paper.

The nest was made of clover and stems of weeds, corn husks, and leaves. It was lined and covered with straw and dried grass. The interior measurements of the nest were 6 cm. x 6.5 cm. in diameter and 4.5 cm. deep. The measurements and weights of the eggs were as follows:

No.	Long diameter	Short diameter	Weight
1	2.12 cm.	1.66 cm.	2.84 grams
2	2.14 cm.	1.64 cm.	2.98 grams
3	2.08 cm.	1.65 cm.	2.85 grams
4	2.20 cm.	1.65 cm.	2.66 grams
Egg no. 4 was sterile.			

The nest shown in Plate IV, fig. b when found on July 21, 1918, contained one young, one embryo just emerging, and two eggs. One of the eggs hatched on the following day, but the fourth was sterile. Two of the birds shown in the nest are four days old and the other three days old.

Plate V figure a, shows the young birds and a sterile egg from the same nest photographed July 18, 1918. The young are arranged in the order in which they were hatched. The young on the extreme right the first to hatch, is the one shown in Plate IV fig. a, in the act of emerging from the shell. The first bird at its left was hatched a few hours later, and the one on the extreme left next to the egg, was hatched on the following day about ten minutes before the photograph was taken. This bird weighed 2.8 grams before it had received any food from the mother. Its weights and measurements on this and successive days are given in Table XII. The same three young are shown in the other figures on Plates V and VI and are arranged in the same order, the oldest bird always on the right, the youngest on the left of the group. The sterile egg is included in many of the figures to serve as a means of comparing the relative sizes of the young. In preparation for photographing them, the young were removed from the nest and placed on a background of black cloth in order to show the parts to better advantage.

In Plate V figure b, taken July 19, 1918, the bird to the right is two days old, and has the first feather papillae of the juvenal plumage broken through the epidermis in the region of the alar tract. Figure d, represents birds two days old, taken from another series, to show the natal down at its best and also the protruding feather papillae of the primaries in the alar tract.

Figure c, shows the original brood at the age of three and four days. Photograph taken July 31, 1918. At this age the young exhibit considerable activity when removed from the nest, the legs are in almost constant motion. The eyes of these birds four days old, are already open, but they are closed when the birds are brought into strong light. The feather papillae are present in all the main feather tracts, those of the wings are considerably lengthened. For measurements, see table XII.

Plate VI, illustrates the same birds, the two at the right in figure a, being five days old, the other four and all feather tracts well defined by projecting papillae. Photograph taken July 22, 1919.

In figure b, the birds are respectively six and seven days old. Photographed July 24, 1918. The feather papillae have now undergone great development and some of them are beginning to unsheath at the tips. The natal down is becoming less important as a covering. Note the great development of the tarsus and toes, well shown in nestling No. 2, in the middle of the group. See table XI for measurements of nestling No. 1, on the left. All nestlings at this age were banded in addition to the marks made by clipping the tips of certain toe nails to aid in identifying the birds after they left the nest. In figure c the six days old bird is placed on its back to show the relative development of the feathers of the ventral tract at this age. The tips of most of the feathers are unsheathed. Persisting tufts of natal down in the head tract are well shown here.

In Plate VII figure a, taken July 25, 1918, the young Dickcissels are seven and eight days old. In this picture the younger bird is on the right.

The egg shown here is the same one shown in earlier photographs. It was left in the nest until after the latter had been abandoned by the young which occurred on July 26. The young seem to have the instinct of fear suddenly developed at this age. This fear seems to be greatly increased when they hear the warning notes of the adults. Observe the awkward legs, which are almost as long as those of the adult.

Figure b, shows the birds eight and nine days old, and was taken July 26, 1919, the last day that they spent in the nest. Birds of this age are unable to fly but they make good use of their legs, which are now fully developed. The feathers of all parts of the body have progressed in the process of unsheathing to such an extent that they now form an effective covering and protection. For a complete description of the plumage of the Dickcissels of this age see text page 176 and for measurements consult table XII, page 172. In figure c, a young Dickcissel ten days old is shown. Notice how the natal down has been worn away by a day among the weeds and grass. These birds were easily found by watching the feeding operations of the female, while the tags and nail marks identified them.

Plate VIII figures a and b, show a bird eleven days of age. This individual was able to fly 100 to 150 feet in a single flight, and when placed on a perch as shown in figures it often exceeded this distance. For a description of this stage of the juvenal plumage see text page 177. In figure c, the bird is twelve days old, and the feathers of the ventral tract are entirely unsheathed. Birds twelve days old are very active and it required no little patience and care to secure pictures of them.

Plate IX, represents a Dickcissel fourteen days old, or six days after it had left the nest. The general coloration of the juvenal plumage of a bird fourteen days old is much duller as compared with the young at the time they leave the nest when the feathers are newly unsheathed. All are now unsheathed excepting the basal portions of the primaries and secondaries while the tail feathers have reached a centimeter and a half in length and are shown plainly in the general contour of the bird.

The ventral view shows the loose flimsy texture of the feathers of the ventral tract in the juvenal plumage which is in marked contrast to the feathers of the first winter plumage, in which the barbules are more closely and firmly interlocked. The partially spread wings show the relative amount of unsheathing of the feathers. See table XII for measurements.

In Plate X, a Dickcissel in juvenal plumage eighteen days old, or ten days after having left the nest is shown. Note the great increase in the length of the tail, a growth correlated with its increased ability to fly.

This bird was able to fly almost as well as the adults with which it was associated. This tagged bird was collected about a mile away from the nest in which it was reared. See table XII for measurements and text page 177 for description.

Plate XI, shows twelve skins of the Dickcissel representing stages from the juvenal to the completed first winter plumage.

Specimen No. 78 at the extreme left upper row is a female eighteen days old in juvenal plumage. All of the others are in progressive stages of the first winter plumage arranged in order, the more advanced stages being to the right. The youngest of these, a female five weeks old (specimen No. 61), has well defined streaks in the region of the breast and flanks but has very little yellow on the breast and belly. As one goes from the younger to the more advanced stages, of the first winter plumage, the streaks become less prominent and the yellow deeper in color and more extensive in area. The markings of the dorsal aspect of a bird in the first stages of the winter plumage is shown by specimen No. 80 at the extreme right. The lower row represents more advanced stages of the transition, birds which are estimated to be more than eight weeks old. See text page 178 for description.

MEASUREMENTS IN CENTIMETERS OF BIRDS SHOWN IN PLATE XI UPPER ROW

Specimen number..	78	61	82	81	75	80
Sex.....	♀	♀	♀	♀	♀	♂
Date collected						
(1918).....	Aug. 5	July 30	Aug. 6	Aug. 6	Aug. 2	Aug. 6
Age.....	18 days	5 weeks	About 6 to 8 weeks			
Bill.....	1.25	1.45	1.50	1.45	1.42	1.50
Wing.....	6.70	7.40	7.40	7.50	7.40	8.70
Length.....	13.30	15.75	15.80	16.10	16.25	17.80
Tail.....	3.80	5.55	5.65	5.30	5.40	6.30
Extent.....	22.80	24.50	23.60	24.30	24.60	27.50
Tarsus with toe....	4.60	4.40	4.50	4.60	4.80	4.90
Tip to tip of toes...	3.70	3.70	3.80	3.70	3.60	4.10
Third or front mid- dle toe nail.....	.52	.60	.70	.62	.60	.68
First or hind toe nail.....	.70	.80	.80	.80	.78	.82
Sixth primary.....	4.80	5.15	5.00	5.10	5.00	5.50
Third secondary...	4.40	4.60	4.65	4.40	4.50	5.00
Weight (grams)....	26.60	29.50	28.60	31.13	27.10	36.70

LOWER ROW

Specimen number.....	68	67	62	77	71
Sex.....	♀	♂	♂	♀	♂
Date collected (1918).....	Aug. 1	Aug. 1	July 30	Aug. 4	Aug. 2
Bill.....	1.40	1.55	1.55	1.50	1.45
Wing.....	7.60	8.40	7.95	8.10	8.20
Length.....	16.25	17.90	16.70	17.30	17.10
Tail.....	5.70	6.90	5.68	6.20	5.85
Extent.....	25.10	27.20	26.10	27.00	26.40
Tarsus with toe.....	4.70	4.90	4.72	4.90	4.90
Tip to tip of toes.....	3.90	3.90	3.90	3.90	4.20
Third or front middle toe nail.....	.70	.60	.61	.70	.70
First or hind toe nail.....	.82	.84	.86	.85	.90
Sixth primary.....	5.10	5.55	5.10	5.70	5.30
Third secondary.....	4.50	5.10	4.90	4.90	4.80
Weight (grams).....	28.47	36.46	29.50	36.00	32.65

Plate XII represents a series of adult males, upper row in nuptial, lower in winter plumage. For measurements and description of specimens collected in Illinois see p. 15 and 16.

Plate XIII shows the adult females, the upper row in nuptial and the lower in winter plumage. Measurements and description of the former will be found on p. 16.

The latter are five skins from the collection of the Museum of Comparative Zoology and from left to right are as follows:

1. Colombia (Santa Marta) Feb. 11, 1898.
2. Corpus Christi, Texas, March 11, 1894.
3. Tamps, Matamoros, Mexico, Aug. 18, 1908.
4. Tamps, Matamoros, Mexico, Aug. 26, 1908.
5. Tucson, Arizona, Sept. 11, 1884.

The author cannot be positive whether these skins represent the adult or first winter plumage, as he has no osteological or other reliable characters upon which to base determinations of age. Nos. 1 and 2 as listed above more nearly approach Dr. Dwight's meagre description, than do the other three.

Searles Biological Laboratory Bowdoin College, Brunswick, Me.

A NESTING OF THE PHILADELPHIA VIREO.

BY HARRISON F. LEWIS.

(Concluded from p. 44).

July 4. The nest was observed from 6.15 a. m. to 6.25 a. m., during which time it was uncovered. At 6.40 a. m., when I approached to climb the nesting-tree, one bird was brooding. When I had reached a position where my head was but a foot below the nest I could hear the low "peep's" of the young birds issuing from beneath the parent. I observed also that the tips of the old bird's tail-feathers were becoming quite frayed. After it had flown away silently the young birds continued their cries unchanged. Two young only would raise their heads and open their mouths when the nest was touched, but those two would do it repeatedly. I could see a distinct line of down on each bird, extending from the top of its head along the nape of its neck and the middle of its back. Pin-feathers showed plainly in the young birds' wings.

The nest was observed at 7.25 a. m., 12.00 m., 12.25 p. m., 4.45 p. m., and 6.43 p. m., but at none of those hours was any bird seen on it. The break-up of regular, sustained brooding seems therefore to have come on July 3rd, two days after the last egg was hatched, as it will have been noted that the nest was uncovered when seen on the afternoon of that day. It is possible that the quarrel observed on the morning of that day bore some relation to this cessation of sustained brooding.

At 6.43 p. m. I climbed the nesting-tree, and when I reached a point where my head was about five feet below the nest I observed a parent Vireo, with food in its bill, on a small twig just below its home. The yellow of its underparts was particularly conspicuous at that time. It looked at me fixedly, but when I climbed two feet nearer to it, it flew away quietly. The young were found to be so large that their heads, when at rest, were on a level with the rim of the nest. Three of them repeatedly lifted their heads and opened their mouths when the nest was touched.

July 5. The nest was uncovered at 7.05 a. m., but at 7.25 a. m. a bird was seen on it.

At 6.10 p. m., when I took a position to observe the nest, no bird was on it. Both parent birds returned to it together at 6.12 p. m., but I was unable to see whether or not they fed the young. A few seconds later they departed, one after the other. At 6.21 p. m. one bird returned, fed the young, and immediately went away again. I climbed the nesting-tree at 6.22 p. m. and found the four young birds much larger than they were before. Their bills had become longer and more pointed, and had changed from yellow to light brown. All four of them would repeatedly lift their heads and open their mouths when the nest was touched. I took the top bird, probably the oldest, out of the nest to examine it more carefully. Its eyelids were open the merest slit. The pin-feathers on its upperparts were a dark bluish-gray and those on its sides and underparts were yellowish-white. An area of short pin-feathers covered practically all of the top of the head, from which a line of such pin-feathers extended down the nape of the neck and the middle of the back to the oil-gland. This line was sparse on the nape of the neck, while in a small area in the middle of the back it was twice its usual width. The pin-feathers on the wings were well-developed, those of the primaries being fully half an inch long. There was a small area of pin-feathers just above each leg. An area of pinfeathers covering the chin and throat divided just above the breast and passed in two broad bands, one on each side, along the sides of the body to a point well past the leg. The lower ends of these bands were each slightly forked. I replaced the young bird in the nest and descended to the ground at 6.29 p. m.

July 6. Between 12.51 p. m. and 2.35 p. m. the young were fed at 12.52, 1.17, 1.20, 1.28, 1.39, 1.46, 1.52 (twice), 1.54 (twice), 2.20, 2.27 and 2.29, a total of thirteen feedings in one hour and forty-four minutes. I have recorded two feedings at 1.52 p. m. because at that time I saw the two parent Vireos stand on opposite sides of the nest and both feed the young at once. At 1.54 both birds were in sight near the nest at once and they fed the young in quick succession. At 1.20 and again at 1.52 one of the old birds, after feeding the young, removed excrement from the

nest and flew away with it. The young birds were brooded from 12.52 to 1.16, from 1.28 to 1.36, from 1.39 to 1.46, and from 2.29 to 2.35, when I departed for a few minutes. A light rain began to fall at 2.34 p. m. When brooding, the old bird often poked its bill beneath its breast to the nestlings, whether for caress, punishment, or rearrangement of the young I cannot say.

At 2.41 p. m. I returned and climbed to the nest, on which the old bird sat closely, but which it finally left in silence. The cries of the young were very noticeable, both before and after the old bird left them. The young themselves were distinctly larger, and the pin-feathers on their heads were further developed than they were before. Their eyes were not yet wide open.

July 7. The young Vireos were fed at 6.25 a. m., immediately after which I climbed to their nest. All four of them lifted their heads and opened their mouths when the nest was touched, but they uttered fewer cries than they had done previously. They were sitting in the nest two abreast, all heads one way, with one pair on top of the other. The eyes of two of them were nearly wide open on this, the eighth day from the hatching of the first egg. I presumed that these two were the oldest (Bird I and Bird II), and could easily distinguish between Bird III and Bird IV. I took one of the two oldest birds from the nest to examine it more closely and found that on all the feather-tracts the pin-feathers had burst. The feathers on the head and back were light grayish-brown, those on the wings were dark gray, and those on the underparts were light yellow. Nine large primaries, each very nearly an inch long, and each overlaid by a covert about half an inch long, could be plainly seen. The outermost of these was about the same length as the sixth (the fourth, if counting from the inner primary). But outside of these large primaries and their coverts were two pin-feathers, not yet burst, about one-fourth of an inch long and of practically equal length. They were inserted one above the other, lying parallel with the large primaries and their coverts, and were very evidently the true first primary and its covert. On this eighth day of nestling life (for I was afterward able to make quite sure that the nestling examined at this time was the oldest of the brood) they are readily observed. I replaced the bird in the nest and descended to the ground at 6.35 a. m.

July 8. At 2.30 a. m. I took a position near the nest. There was a dead calm at the time, the cloudless sky, in which was no moon, was lighted brightly by stars, and along the eastern horizon the bright glow of dawn had already appeared. The temperature was 49°F. Nothing was heard or seen of Vireos of any species until 3.33 a. m., when a Red-eyed Vireo began to sing in the oak woods. A light breeze began to stir the leaves at 3.35. The true time of sun-rise at Quebec on this date was 3.59 a. m., but sunlight was first noticed on the tops of the tall pine-trees at 4.14 a. m. If one of the parent Philadelphia Vireos was on the nest during the night, it must have left it before there was enough light for me to distinguish it, for the first that I saw or heard of this species on this occasion was a visit to the nest by one of the old birds at 4.06 a. m., when the young were fed. The first song from the male Philadelphia Vireo was heard at 4.19 a. m. Between 4.00 a. m. and 7.00 a. m. the young were fed at the following times: 4.06, 4.17, 4.29, 4.31, 4.38, 4.39, 4.40, 4.42, 4.45, 4.48, 4.49, 4.50, 4.52, 4.55, 4.56 (twice), 5.30, 5.54, 5.55, 6.00, 6.02, 6.03, 6.04, 6.05, 6.09, 6.12, 6.15, 6.18 (twice), 6.21, 6.28, 6.30 (twice), 6.32, 6.35, and 6.51, a total of thirty-six feedings, or nine for each young bird, in the first three hours of morning activity. At the times which I have marked "twice" the two parent birds fed the young in quick succession; I did not on this date observe them both giving food at the same instant, as I did on July 6. Between 4.05 and 4.57 there were sixteen feedings, between 4.57 and 5.53 there was one feeding only, and between 5.53 and 6.53 there were nineteen feedings. It will be observed that the feedings exhibit a marked periodicity, as though the young were given regular meals, with intervals of comparative rest. A similar periodicity can be distinguished in the feedings recorded on the afternoon of July 6, there being on that date an interval of twenty-five minutes from 12.52 p. m. to 1.17 p. m. and another interval of twenty-five minutes from 1.55 p. m. to 2.20 p. m. during which the young were not fed, although they were fed quite frequently before, between, and after those periods. It would be very interesting to obtain a record of the meal-hours and rest-hours throughout an entire day. It may be thought that the parent birds were simply satisfying their own hunger

during the periods when the young were not being fed, but my observations on this morning of July 8 do not support this view. From 5.10 a. m., or slightly earlier, one of the adult Philadelphia Vireos, with food in its bill, was seen sitting quietly on an oak twig about two rods from the nest, turning its head at times from side to side. The young were not fed at all during the twenty minutes or more of its remaining in that position, but at 5.30 it finally went to the nest and gave the young the food which it had been holding in its bill. Again, for seventeen minutes, from 5.37 to 5.54, I observed one old bird, with food in its bill, sit quietly in an oak while the young were not fed. It eventually took the food to them at 5.55 a. m. It is easy to understand that, when food is very plentiful, the parent birds could, by ceaseless endeavor, gather much more than they and their brood could eat, but it is worth while noting that, instead of distributing their spare time among feedings at average intervals, or of relieving one another in the work, they both cease feeding together from time to time, thus marking off fairly distinct meal-hours for the young.

I saw that excrement was removed from the nest at 4.31 a. m., but it is probable that such nest-cleaning often took place without my being able to observe it. I also noted at this time that from the ground I could see the young birds moving about in the nest when no old bird was near, and could also hear their "peep's." I ceased observing at 7.00 a. m.

At 5.13 p. m. I climbed to the nest. No cries were heard from the young as I ascended the tree, and when the nest was touched two only would raise their heads and open their mouths. I removed from the nest and examined three of the young, no two of which were equally developed. The one most developed was fairly well covered with feathers on its head, back and wings. Its short first primary had not yet burst its sheath, although the covert over it had burst out and was growing rapidly, as were all the other coverts and primaries. I replaced the birds and descended to the ground at 5.26 p. m.

July 9. The nest was observed at 6.55 a. m., 7.25 a. m., 12.00 m., 12.25 p. m., and 4.00 p. m., but no adult Vireo was seen near it at those times. At 4.12 p. m., when I took a position to observe the nest, no old bird was in sight. At 4.25 the two parent Vireos

went to the nest together, perched on opposite sides of it, and both fed the young at once. They next seemed to be occupied for several seconds in working together over the young, shifting them about in the nest, or something of that sort. Then one, presumably the male, left and began to sing loudly from the oaks, while the other bird sat quietly beside the nest until 4.34, when she departed by short flights from branch to branch. At 4.44 p. m. I climbed to the nest without seeing anything of the adult Vireos. I removed all the young birds from the nest and examined them. The "peep's" uttered by the two older members of the brood had by this time developed quite a buzzy quality. These two showed plainly the white line over the eye. The oldest of all was very yellow on the underparts, while the three others had the underparts white, with a slight, but distinct, wash of yellow. Individual variation in the degree of yellowness of the underparts, which showed itself at this early age, remained present in a striking degree in this brood as long as I was able to watch them, and it is not improbable that it appears in the adult plumage also, which would explain the differing estimates of this coloration which different observers have made. I could not see any difference in the degree of yellowness of the underparts of the parents of this brood.

On the two older birds the sheath of the short first primary appeared at this time to have opened at the tip, but, instead of a vigorous quill, only a few hair-like barbs protruded from it. These were completely overshadowed by the covert, which was growing rapidly.

I replaced the young birds in the nest and descended to the ground at 4.59 p. m. On viewing the nest, I saw that its occupants were moving about a great deal. At 5.00 p. m. one old bird appeared, with food in its bill, and hopped excitedly about the nest. It gave its burden of food to one of the young, then flew to the next tree, where it moved rapidly about, with crest raised, uttering the scolding note. It gave the young no aid in readjusting themselves in the nest. The oldest of the brood finally stepped out onto the twig beside the nest, where it maintained its balance with difficulty. Both old birds were now present, scolding continually, but keeping well away from the nest.

At last the young bird fell headlong, but with great dexterity grasped another twig about eighteen inches below the nest, and maintained its grip there. I climbed the tree again and, as I drew near to the youngster, one only of the parents dashed at me, crest erect, scolding loudly and rapidly. This was continued until I left the tree and was the first scolding I had received from an old bird when I was in the tree. The only previous time when one of them made any audible protest on such an occasion was on the afternoon of July 3, when the female uttered a few squeaks. I replaced the young bird in the nest and descended to the ground at once. When I had stepped away from the tree I heard the cries of a nestling, as though it had left the nest while I was climbing down. I could not see it, but decided to go up the tree again, which I did, finding three young only in the nest. This time both old birds came close about me and scolded me vigorously. I could not find the stray nestling, so returned to the ground and left the vicinity.

When I returned, at 5.53 p. m., all seemed quiet, but after a little I heard repeatedly the buzzing "peep" of the oldest nestling. The note seemed to come from somewhere in the lower foliage of the tree, but it was only after a long search that I found the young bird, snugly esconced in the acute angle formed by the lowest fork of the tree, where the trunk divided into two nearly equal parts, at a height of about five feet from the ground. I was greatly surprised to find that it had descended nearly twenty feet through the tree without sustaining any injury. I replaced it in the nest at 6.10 p. m. At 6.35 I climbed the tree and found that it was still in the nest.

July 10. I climbed to the nest at 6.35 a. m. and at 4.24 p. m. The first time both old birds appeared and scolded me as I went up the nesting-tree. The four young in the nest would not lift their heads at all when the nest was touched at that time. In the afternoon, however, I saw nothing of the parents when I visited the nest, and three of the young would beg for food as usual when the nest was touched.

July 11. By this date the young were so large that their wings hung over the edge of the nest. At 6.10 p. m. I climbed the nesting-tree, without seeing the parent Vireos, and found in the

nest four well-feathered young, which did not raise their heads or open their mouths when the nest was touched.

July 12. A few notes of *Philadelphia Vireo* song were heard about 5.00 a. m. At 5.40 a. m. I heard the persistent notes of one of the nestlings and thought that it must be out of the nest. When I reached the vicinity of the nesting-tree, at 5.47 a. m., the begging notes of this young bird continued to issue from the neighborhood of the nest, while one old bird was scolding in another tree nearby. The young in the nest were fed at 5.48, 5.53, and 5.57 a. m. Soon afterward I caught sight of the young bird which was out of the nest. It was several feet from its old home and maintained itself on a twig with apparent ease. Sometimes it would move a few inches, from one twig to another, when it would gain a new foothold only after much fluttering.

It therefore appears that, with this species, the time from the hatching of the first egg to the departure of the first bird from the nest is thirteen days, although my frequent visits to the nest may have shortened the time slightly in this instance.

At 6.09 a. m., while one old bird scolded me, I climbed the tree to try to catch this young bird for a last examination of its appearance before it should become able to keep beyond my reach. In this endeavor I passed near, but below, the nest, when I heard another young *Vireo* flutter from it. I then held a mirror over the nest and saw in it two motionless young. The bird which I was trying to catch finally flew from the tree and alighted on a gravel roadway about sixty feet from its starting-point. It did not seem to be able to make an upward flight. I returned to the ground and picked it up. It did not attempt further flight, nor did it make any outcry when I took it in my hand. I found the second young bird on the ground about ten feet from the foot of the nesting-tree and picked it up also. Bird I was very yellow beneath, while on the back and on the top of the head the feathers were mouse-colored, but with yellow tips. The whitish line over the eye showed plainly. Some remnants of down were still to be seen. The flight-feathers and wing-coverts were a dark gray, mostly edged with yellow on their front edges. The bill was light brown, with the hook at the tip of the upper mandible well-developed. The iris was a very dark brown. The tail was not

more than five-eighths of an inch long. The short first primary was now well out of its sheath, and was about three-eighths of an inch long, all gray, and very distinct when sought for, but ordinarily concealed by its covert and by the large second primary. A view of the primaries from below at this time reminded me strongly of the cut of the primaries of the Warbling Vireo as shown by Coues.⁴

Bird II resembled Bird I, although slightly less developed, except that its underparts, instead of being yellow, were white with a yellowish wash, and that the feathers on the top of its head lacked the yellow tips.

I placed the young birds in the lower branches of the nesting-tree, where they stayed fairly well, although from time to time an attempt at flight would bring them fluttering to the ground. They were picked up each time, always without protest on their part, and replaced on a safe perch, for fear of cats. The parents fed them frequently, and seemed to try to entice them toward the refuge of the woods. At 6.45 a. m. Bird I was seen on a perch about eight feet from the ground in a tree some thirty feet from the nesting-tree, so that it was evidently learning the art of flight quite rapidly.

At 6.50 a. m. I found Bird III out of the nest and perched in the lower part of the woodbine which climbed on the front porch of the house. When I tried to pick it up it fluttered away from me and when I finally grasped it it screamed loudly for a second or two. This was the only time that it or any of the brood acted in this way when picked up. It resembled Bird II, except that the tips of the feathers of the back were slightly browner and less yellowish. It also was placed in a tree.

I was obliged to depart at 7.25 a. m., but during the morning Mrs. Lewis watched over the three young Vireos and replaced them on safe perches whenever they fluttered to the ground, which, she assured me, was quite frequently.

At 1.00 p. m. I found Bird I on a perch about fifteen feet from the ground, where he could hardly be seen. He was now silent nearly all the time except when being fed. A little later he moved

⁴ Key to N. A. Birds, Fifth Ed. 1903.

to some other perch and I saw him no more. Birds II and III remained in the immediate vicinity all the afternoon and had to be picked up frequently. Bird IV remained alone in the nest and uttered a begging note similar to that of the other young birds of the brood. When a parent with food approached a juvenile out of the nest, the youngster, whether previously silent or begging, cried sharply in a screaming voice, with wings fluttering, body trembling, and mouth wide open, until it received the food. If one of them was held in the hand and its bill hit with a finger, it would act in a similar manner.

At 7.45 p. m., when dark was coming on, Birds II and III were seen perched on separate maple twigs, each with its head under its left wing, fast asleep.

July 13. The begging call of the young Philadelphia Vireos was first heard on this date at 3.48 a. m. When I went abroad at 8.10 a. m., quietness prevailed, but I soon found one young bird, probably Bird III, on a perch in the woods. It remained in that neighborhood throughout the day, being silent nearly all the time. I presumed that Bird II had made its way safely to the higher branches, beyond reach of my gaze.

At 9.02 a. m. I climbed to the nest and found Bird IV still in it. When I was not near it, it cried frequently. At 2.30 p. m. I found it on the ground about twenty feet from the foot of the nesting-tree and placed it on a twig near Bird III. These two birds resembled each other closely. At 4.35 p. m. I climbed to the nest to make certain that it was empty and that the last bird found was really Bird IV. Although the nest was empty and the young birds were two or three rods away, one parent bird, presumably the female, came close about me in the tree and scolded me vigorously. She was the only bird seen to feed Birds III and IV during the day.

At 7.42 p. m. these two young birds were seen fast asleep on maple twigs with their heads tucked under their right wings. Apparently they put their heads under either wing indifferently.

July 14. At 6.10 a. m. Birds III and IV were on their perches of the night before, but both were now silent except when they were about to be fed. A few minutes later I returned to find that Bird IV was still in its former place, but that Bird III had moved

elsewhere. I lacked time to search for it. Bird IV was noted again, for the last time, at 7.25 a. m.

At 12.00 m. I could see no *Philadelphia Vireos* in the vicinity, although I could hear the scolding note of one of the old birds far within the woods, where I had not time to seek it. I obtained no further observations of birds of this species which could be ascertained to belong to this family group. I shall be delighted if, in spite of my intrusions on their privacy, they return to nest near me next year.

The following is a brief outline of the chief events of this nesting:

June 12. Male seen chasing female.

June 13. Nest-building well advanced. Lining of nest not finished.

June 15. First egg laid.

June 18. Fourth (last) egg laid.

June 29. First egg hatched.

July 1. Third and fourth eggs hatched.

July 3. First cries of young heard.

July 12. Three oldest nestlings left nest.

July 13. Fourth nestling left nest.

July 14. Last observation of nestlings (two only).

NEST.

About four feet from the top of a young Rock Maple which was one of a row of such trees a small twig sprang at a considerable upward incline from the south side of the main stem of the tree, which was here one and one-fourth inches thick. The twig itself is one-fourth of an inch in thickness, and at a distance of one and one-eighth inches from the main trunk it divides at an angle of fifty degrees into two nearly equal parts, each of which is about five inches long and ends in a cluster of leaves. The pensile nest, which was well hidden and shaded by foliage, was hung from the fork between these two small twigs, at a height of twenty-four feet, eight inches, from the ground. Although the lower part of it is roughly circular, the rim is "gathered" to the twigs, so that the opening is shaped like a sector of a circle, with the two twigs

as radii, and the outer rim as the arc of the sector. The acute angle between the twigs is filled in for about three-quarters of an inch with nesting material. The "gathering" of the rim of the nest, causing the walls to be incurved at the top, must have been efficacious in retaining eggs and young within it when it tossed and swayed in the breeze, as it did very much in the slender top of the tree.

The inside dimensions of the nest are: along one radial side, $1\frac{7}{8}$ inches; along the arc between the twigs, $2\frac{1}{2}$ inches; maximum diameter within the bowl of the nest, $2\frac{1}{8}$ inches; least depth (at center of arc), $1\frac{3}{8}$ inches. The outside dimensions are: extreme width, $2\frac{5}{8}$ inches; radial measurement from vertex of angle of twigs to outer extremity, $3\frac{1}{4}$ inches; least height (at center of arc) 2 inches. The thickness of the bottom of the nest is $\frac{5}{8}$ of an inch, while the walls vary in thickness from $\frac{1}{4}$ of an inch to places where one can see through them readily.

The outside of the nest is composed of fine strips of the outer bark of White Birches, dead grass blades, coarse white hen feathers, bits of frayed white twine, one spider's white "cocoon," and much spiders' web. The birch bark is much the most conspicuous material. Ends of strips of it have been left loose, so that they flutter in the breeze, breaking up the outline of the nest and helping to conceal it. At points where strips of birch bark cross one another they sometimes seem to possess mutual adherence without visible binding material, as though they had been gummed together, perhaps by the bird's saliva. The nest is fastened to the twigs by spiders' web, strips of birch bark, string, and grass blades. The interior is lined chiefly with fine dead grass stems and flower-spikelets, but the lining includes also one or two needles of the White Pine and several white hen feathers, finer than those on the outside of the structure.

The nest has been presented to the Biological Museum of Laval University, Quebec.

VOICE.

The songs of the Philadelphia Vireo present marked peculiarities. The song heard from the male from June 13 to June 22, inclusive, was simple, but delightful; a low, sweet, gentle "Doo-

we? wheè-hoocy; doo-we? wheè-hoocy," uttered slowly and with long intervals between one utterance and the next. Sometimes the first utterance was elaborated into "Doodle-ee?" It was so low that it never would have been noticed by one who was not a bird-student, and it was so unlike the other Vireo songs with which I am familiar that I never should have thought the utterer a Vireo before seeing him. This song was uttered by a bird on the nest, by a bird hunting food, and by one bird when attending the other during nest-building. I cannot state positively that the female, as well as the male, utters it in its entirety, but I think that she does so, as I have heard her sing a loud "Doodle-ee?" This song was never sung frequently and was heard very rarely after June 22.

On June 21 I counted for five minutes the song-utterances of a bird which was singing this song among the oaks, and found the number of utterances per minute to be seven, seven, nine, eleven, and six, respectively. A similar count for one minute on June 22 of the utterances of a bird singing this song from the nest showed seventeen utterances to the minute, which I consider to be quite the highest rate at which I heard this song delivered.

A study of the songs of a number of Red-eyed Vireos about Quebec showed that they often contained "Wheè-hoocy," but never "Doo-we?," with the sole exception of the song of the Red-eye which was neighbor in my shade trees to the Philadelphia Vireo. This bird sang both of the above-quoted utterances, which made me wonder if his song had been affected by that of his nearby relative. He and the other Red-eyed Vireos, however, uttered all their notes in their usual vigorous, matter-of-fact tone, very different from the sweet, low, gentle tone of this slow song of the Philadelphia Vireo.

On June 23, and often thereafter, the male Philadelphia Vireo sang a song altogether different from that which I have described. This new song was loud and vigorous, and was readily recognizable as a Vireo's song, although the tone in which it was given was not quite so full as is the tone of the song of the Red-eyed Vireo. It consisted of notes like "S-s-càpe! ee-òh-yuh! ee-yòit! chèeb-ly!", and perhaps one or two others, repeated over and over in different orders. The utterance "S-s-càpe!", which was the

most striking part of the song, was sometimes rendered more completely as "S-s-s-càpe-s-s-s!". Very rarely two notes were uttered without any intervening pause. This song was sung very frequently from June 23 to July 4, although the bird was much more silent on cold, windy days than it was in fine weather. On June 24 I noted that the Philadelphia Vireo was singing far more persistently than was the neighboring Red-eye. Counts of its song-utterances for three minutes on that date gave twenty, twenty-eight, and twenty-nine phrases, respectively, per minute.

On June 25, when the female had left incubation to feed, the male, while following her through the lower branches of the trees, sang, in a loud voice, "Chee-òw-y! hee-ùh!", over and over again. This song was heard at such times only. Other loud songs which were heard often from this male after June 23 were "Whèe-hoit! s-s-s-jèrry!" and "S-s-s-chèw-ee! whèe-hooey!" After July 4 singing rapidly declined, the last song heard from this species being a few loud notes on July 17, three days after I ceased to find the juvenals.

A Philadelphia Vireo which was resident in 1919 in an area of White Birches about one hundred yards behind my house usually sang repeatedly, in a loud voice, "S-s-s-kòo-hee? s-s-s-kill-it-wàyw! s-s-s-wày-wer!" Other Philadelphia Vireos heard during the nesting-season sang similar loud songs, but the songs of no two of them were exactly alike. It would appear that, as with other common birds, the loud songs of individuals of this species differ, but are all specifically recognizable on account of similarity in quality and tone. I might point out that many common song-phrases of the Red-eyed Vireo, such as its plain little "Huh-huh," do not appear in any recognizable form in the songs of the Philadelphia Vireos heard by me, and that this seems to provide one ready means of distinguishing between the songs of the two species.

All the loud songs which I heard from Philadelphia Vireos were heard between June 23 and July 17, and this fact, combined with the inconspicuousness of the species and its similarity in appearance to other Vireos, seems to explain why so few specimens of this bird are noted in migration, and why Brewster, as he himself suggests, failed to find the species about Lake Umbagog between

May 12 and June 15 in 1896 and 1897, although he had formerly found it common there. If prior to the middle of June or later, this species is silent, or sings only in a low voice, unlike Vireo voices in general, it might easily be overlooked. A loud song heard by Brewster² at Lake Umbagog on June 14, 1903, may be found to be an exceptionally early one.

The only songs which I know with certainty were uttered by the female are two loud "Doodle-ee's," a few very low notes, and the song which she sang just after laying her last egg on June 18. This latter song was very sweet, clear, and simple, and was sung slowly for eight minutes in a low voice. It consisted of a variety of notes, such as "Hùllit; ee-dò-it; wày-wer; ee-chèw-ee; doo-we?; hùllit-whew!", uttered over and over in a different order each time. The effect was charming. Philipp and Bowdish³ speak of the female singing from the nest in reply to the male, but I noticed nothing like this except that the female sang "Doodle-ee?" twice from the nest while the male was singing in the woods just after they had fought together furiously on the morning of July 3.

Other notes heard from the adult birds were a mouse-like squeaking, a scolding note, a fine "It, it, it, it, it," and (from the female only) a "Mew, mew." The squeaking seemed to be generally a love-making note, uttered when the birds were close together, though on July 3 it was uttered in protest against my presence at the nest, as well as during the quarrel between the adult Vireos. The scolding note resembled distantly that of the Red-eyed Vireo, but was not so loud and was shorter, harsher, and less resonant. It was often uttered three or four times in close succession. When the birds were very angry it became prolonged and double-syllabled, a grating "Ee-yùh!" The fine "It, it, it, it, it," which was uttered either when perching or when on the wing, seemed to be a conversational note, and reminded me much of a similar fine note of the Red-breasted Nuthatch. The "Mew, mew" of the female apparently indicated readiness for coition.

The first note of the young was a faint "Peep, peep, peep." By the time they left the nest this had become louder and harsher,

² 'The Auk' XX, pp. 369-376. October, 1903.

³ 'The Auk' XXXIV, pp. 265-275. July, 1917.

a loud "Weh!", like the begging note of young Robins just out of the nest, but a little shorter and weaker than that. It was found by direct comparison to be much harsher than the begging note of a young Red-eyed Vireo. Sometimes it was two-syllabled and sounded like "Ke-wèh!". When a young bird was first out of the nest it uttered this note at frequent intervals as a begging call, but it appeared to cease using it as soon as it could accomplish a successful upward flight, generally within twenty-four hours after it had left the nest, this being in marked contrast to the continued use of the begging note by young Red-eyed Vireos. When a young Philadelphia Vireo was about to be fed it cried "Z-z-z, z-z-z-z, z-z-z," in loud, screaming tones.

FOOD AND FEEDING HABITS.

Food which I saw the adult Philadelphia Vireos take to their young consisted largely of naked caterpillars, brown, green, and whitish, and of flying insects of various kinds. On July 4 I saw the young being supplied with an insect which Mr. Dionne identified, from my description, as one of the Ephemeridae, probably *Palingenia bilineata*. When the nest was taken down, after the young had left it, it was found to contain the shell of a young snail (*Limnea* sp.?) and the remains of the abdomen of some small flying insect, such as a fly or a wasp.

The birds fed usually in the border of the woods, among the lower limbs of the Red Oaks and Red Maples, less often among the White Birches or the Rock Maples. The pair which resided among the White Birches a hundred yards behind my house probably fed among them.

I found the Philadelphia Vireos to be rather more active in their feeding-habits than are the Red-eyed Vireos. The trick mentioned by Dwight⁵ of hanging back-downward, like a Chickadee, from a cluster of leaves while picking insects from it was observed frequently, but the majority of the food of this species seemed to be taken while the birds were on the wing. They would leap repeatedly into the air to snap up passing insects with distinct "click's" of the bill. At other times they were seen

⁵ 'The Auk,' XIV, pp. 259-272, July, 1897.

hovering like Kinglets before branch-tips while they gathered food therefrom. The work done by this pair of Philadelphia Vireos must have aided greatly in keeping the trees in their vicinity free from insect pests this summer.

OTHER ACTIONS.

A third Philadelphia Vireo was seen several times in the vicinity of the nest. On July 1, at 5.38 p. m., one bird was seen to relieve the other on the nest while a Philadelphia Vireo sang continually from among the oak trees. On July 8, at 6.03 a. m., the female was about to feed the young birds, while the male sang nearby, when a third bird of this species approached the female. The singing male darted at him and chased him about for two or three minutes, until at last he departed. While the chase was going on the female continued to feed the young. At 6.05 a. m. two old birds were peacefully beside the nest, where one of them fed the young, while the song of a Philadelphia Vireo came from the oaks. On the morning of July 12, when the young birds were leaving the nest, I thought I saw three adults of the species about, and, by "squeaking," I was able to bring all three into view in front of me for a moment.

The three Philadelphia Vireos remained about the young all that day, and one of them was observed to chase the female frequently while she was seeking food and bringing it to the young. At such times the pursuer uttered the fine "It, it, it, it, it." The next day, July 13, similar pursuits were seen, but the female appeared to take more kindly to them. Several times in the morning and once in the afternoon she was noticed to fly toward her pursuer, perch, lift her tail, and cry "Mew, mew," immediately after which coition apparently took place. Sometimes this occurred while another male Philadelphia Vireo sang very near at hand. Although I watched closely, I was not able to discover any other signs of the rearing of a second brood.

In the afternoon of July 13 a young Red-eyed Vireo just able to fly wandered near the young Philadelphia Vireos, and in consequence the two busy mother birds met frequently while seeking food for their respective young. At such times they would quarrel violently, and the Philadelphia Vireo was always driven some dis-

tance away. Each time she returned to her duties as quickly as possible.

ABUNDANCE

The particular pair of Philadelphia Vireos whose nesting I have described took up most of my spare time during the nesting-season of 1919, which was my first nesting-season at Quebec. In consequence, I did not obtain much information regarding the abundance of this species in this vicinity at that season. Altogether I noted seven singing males of this species, besides the apparent intruder on the family life of the pair near my house. Of these seven, one nested in my yard, one resided in the White Birches one hundred yards or so behind my house, and the third lived in shade trees near a house about one-quarter of a mile away. The four others were heard singing on a trip made on June 30 to the valley of the lower Montmorency River, about ten or twelve miles northeast of Quebec. Two of them were in hardwood second-growth on poor, sandy land, and the other two were in alders beside the river, all at an elevation of from three hundred to five hundred feet above sea-level. Choosing one individual, out of the four, I followed up the song to verify identification by looking at the bird, and saw it plainly for some time at a distance of six feet, identifying it beyond question. Probably the species is not uncommon about Quebec.

It has never been recorded from this vicinity before, and indeed I can find only two records of its occurrence in the province, that of Dwight¹ of birds seen and taken at Tadousac, about one hundred twenty miles northeast of Quebec, and a record mentioned by Brewster² of a breeding specimen taken in Quebec Province near Ottawa.

Bergerville, P. Q., Canada

¹ 'The Auk,' XIV, pp. 259-272. July, 1897.

² 'The Auk,' XX, pp. 369-376. October, 1903.

NESTING HABITS OF THE NIGHTHAWK AT TACOMA,
WASH.

BY J. HOOPER BOWLES

At about 7.30 p. m. on June 22, 1919, a friend asked me to come and see a young owl that was perched on the roof of a nearby house in Tacoma, Wash. Hurrying down I saw a bird sitting perfectly upright on the ridgepole, which certainly looked very much like a fluffy young Screech Owl. I suggested that we watch it for a while as it looked suspicious. To make a long story short, about an hour and a half later it suddenly collapsed to about a third of its former size, gave a screech and sailed off, a very able-bodied adult Nighthawk. This was the first time I had ever seen a bird of this family, resting in any other than a flat position. It at once skimmed over the roof of a neighboring building and mounted above it several hundred feet in the air, when it dropped like a plummet to within a yard of the roof, then sheared off and repeated the act. On the downward swoops it gave the peculiar bellowing note, which has earned it the name of "Bull-bat." This has been attributed to the air blowing into the wide open mouth, but seems really to be due to its passage between the primaries. This performance was the courtship of the male to his mate on the gravel roof. A few days previous my attention was called to a Nighthawk courtship directly over the apartment house in which I live. Consequently, on July 4, 1919, I considered it high time to investigate, as the janitor was cleaning off the roof, and the following observations resulted.

The Nighthawk of Tacoma seems to be intermediate between *Chordeiles virginianus virginianus* and *C. v. hesperis* though probably nearer to the latter.

July 4, 1919. Found a nest on the roof, after bird had been frightened away by a man. The parent was rather wild, staying on the roof of a building opposite. Weather cool, but sun out. Photographs of nest taken, when eggs were two inches apart, as left by bird.

July 6. Visited the Nighthawk nest and found the bird on. She would not let me get nearer than twenty feet before leaving the nest, when she flew to the opposite building as before, remaining there until I left. The eggs today were touching each other when the bird left them.

July 9. Visited the Nighthawk nest and found bird on, but she would not let me get any nearer than last time before leaving. This time she did not fly from the roof of the building, but alighted about seventy-five feet away. Sun shining and exceedingly hot so that I had difficulty in getting onto the roof as I could not touch my hand to it without burning. The eggs were about an inch apart, and I was afraid the heat would roast them. I believe the bird felt the same way about it, as I had no sooner climbed into the hole in the roof than she at once flew to within three feet of the eggs. She hesitated a few seconds and then walked rapidly to them and settled on them, tucking them into place under her with her bill and chin. I waited a few minutes and then made an attempt to photograph her, but she flew at once, alighting on the roof about the same place as before. I at once retired to the hole and she, as quickly, flew back to look after her eggs. This time she dropped about ten feet away from them and the bright sunshine evidently made her sight very imperfect. She walked towards the eggs, but before coming near them turned to one side and settled upon an egg-shaped pebble. She did not discover her mistake until she tried to tuck it in under her, when she promptly left it and started again towards the eggs, only to be again turned aside by another pebble. The same actions were repeated, but the third attempt brought her safely to her eggs which she tucked under her with every evidence of satisfaction. One thing that greatly surprised me was the ease and rapidity with which she walked, which would seem impossible for a bird with such very small and weak feet and legs. She stood high up and walked as rapidly as a pigeon and with much the same gait, although there was no motion of the body as in pigeons. In fact perhaps the action might better be likened to a sandpiper, although she did not lean over as they do.

So far only one bird had been seen, and I was curious to know where her mate keeps himself.

July 11. Visited the Nighthawk nest and found the bird on, but she acted precisely as before alighting at the same spot on the roof. The day was overcast and decidedly cool. I believe this is the reason that the bird did not return to the nest for ten minutes after I retired to the hole in the roof. She finally dropped about five feet from the eggs and stayed there watching for about two minutes, then walked to the eggs and settled upon them, tucking them carefully into place as before. This time she did not stand high as she walked, and her body leaned over precisely like a sandpiper, which she strongly suggested in her action. So far she had uttered no call note of any kind.

July 13. Visited the Nighthawk nest at 11.45 a. m., when I found the female on the nest, as usual. Upon flushing her I found both eggs hatched, but on one of the young the down was not completely dry, and the egg shell was still in the nest. Only a small portion of the other egg shell was in sight and the young bird while completely dry, was for some reason not as lively as the newly hatched one.

The female allowed me to come within six feet of her, which gave me a chance to take her photograph. She then flew about twenty feet and dropped to the roof, fluttering along as I followed her. After photographing the young I took the empty shell out of the nest, which act caused the newly hatched bird to jump out of the nest about an inch. When I stepped back he promptly walked back to the nest again. I was greatly surprised at the strength of this tiny bird, which could not have been out of the egg more than a very few minutes. Its movements were quick and strong, and I was again reminded of a sandpiper. The young had a coat of rather long down. The nest is simply a circle two- and three-quarter inches in diameter, which is scraped clean of pebbles, but it is evidently well recognized as the home site.

The day was bright and sunny, but there was a cool wind blowing strongly, so I did not stay any longer than was necessary to take photographs, as I feared the newly hatched young might possibly become chilled. The older of the two little ones kept up a continuous "peep, peep," but made hardly any movement. The younger one did not make a sound, but showed plenty of action. The eyes of both were open. I know of no family of

land birds in which the newly hatched young at all approach this development, excepting the *Gallinae*.

July 14. Found the bird with her young but she flushed at twenty feet distant. The young had grown astonishingly since yesterday and were a couple of feet from the nest site, sitting side by side. I examined their legs and feet and was surprised to find them large and strongly developed, which accounted for their ability to move about so quickly.

The parent returned to within a few feet of her young very soon after I retired to the hole in the roof. She walked hurriedly to them and settled about an inch away, when they at once ran in under the shelter of her feathers. They made no sound today, even when I handled them, and the parent has never uttered a note in my hearing. The color of the down on the young is a buffy gray, with shadings here and there of lavender brown.

July 15. Today has been extremely hot, the hottest of the season, and I decided not to visit the Nighthawk until evening hoping to see the young fed. While standing below, last evening I saw the female leave the roof and begin feeding at 9.15, so tonight I went up at 9.00 and found her covering her young. They were about twenty feet from the original site and close to a chimney the change very possibly being made for shade, as the heat today up there must have been intolerable to anything but a Nighthawk. I was surprised to find that, in spite of the twilight, she let me come within five feet of her before leaving. She flew about fifteen feet and then lay on the roof with wings outspread and mouth wide open but made no sound whatever. I retired to my hole in the roof and, after about five minutes, was much pleased to see her take wing and commence feeding. This she continued to do for ten minutes, following a circle with a radius of three or four hundred yards, during which time I saw no other bird of this species. The young meanwhile had remained motionless, stretched out perfectly flat, a great stride in intelligence over yesterday when they knew no better than to sit with their heads up. When the female returned she dropped about ten feet from them and watched my hiding place intently for several minutes, then walked directly to her young. As soon as she reached them they began a veritable dance, standing high on their legs and flapping their little

wings as they tried to reach her mouth, their own mouths extended to the utmost. She fed them largely by regurgitation, as might be expected, seeming to favor one more than the other, and putting the food into their mouths very deliberately. After finishing she settled down over them and I awaited further developments. I had almost decided that everything was over for the evening when I heard a familiar screech in the distance and soon another Nighthawk sailed high overhead, circling ever nearer with an occasional screech. It seemed very suspicious, making several feints at alighting before it finally did so about fifteen feet from the female and young. The white patch in the tail and the white throat identified this bird as a male, and I was glad to find that he had not deserted his family, as does his near relative the hummingbird. He stood watchfully for some time and then walked swiftly to his mate, who had not made the least sign of recognition. As he reached her she walked away a couple of feet from the young, who greeted their father literally with open arms. I have never seen a bird of any kind stand as erect as these baby Nighthawks. With their heavy coats of down and waving downy wings they reminded me of a pair of tiny dancing bears, for they were able to stand upright for at least a minute. The male fed them equally and evidently had a considerable supply of food, as he went through the motions of regurgitation frequently. The female had walked around to my side of them and, when he left, she walked at once to the young and covered them. I waited for some time but, as the male did not come back and the female seemed asleep, I concluded that the performance was over.

July 16. I visited the Nighthawks at 7.30 p. m. and found the female covering the young. She is becoming much tamer and let me come within five feet before flushing, dropping to the roof a few feet away with outstretched wings. I lifted one of the young to its feet, when it ran at a good pace for about twenty feet before stopping, standing very upright all the while. The young are now only three days old, but are as active as young quail of the same age, which they resemble very closely. The parent bird made a wise selection when she chose a roof with a wall all around it.

July 17. Visited the Nighthawks at 9.00 a. m. The female acted the same as last night, but, while stretched on the roof after leaving the young, emitted a very faint hiss—the first sound of any kind I have heard from her. I was some time in taking pictures and testing the strength of the young. When trying to run their fastest, they flap their wings, which seems to help them in maintaining a more upright attitude. When I finally retired to the hole in the roof the female at once ran to them, when they sought shelter under her. Although she had been away from them fully as long as when she gathered food in the evening, they made no motions at all as if desiring anything to eat, and evidently did not expect anything. This seems very unusual for young birds. Their sight is good in the daylight. They must run about a good deal at night, as I never know where to find them now, when I go up.

July 18. Visited the Nighthawks at 9.30 p. m. Neither of the parent birds was present and the young were side by side facing in opposite directions, as is always the case with young hummingbirds in the nest. I have been watching for this, because of the close relationship of the two groups, but it has not happened before.

I sat down a short distance away and, after waiting about ten minutes, the male appeared and circled around. At times he came within ten feet, uttering an occasional screech, after which he settled about fifteen feet from the young. Hesitating for a minute, he then walked to within a foot of them and they ran to him as usual, but the manner of feeding was completely changed. The parent crouched flat and opened his mouth wide, while the young stood up and plunged in their heads, rooting around like a couple of little pigs for their food. After the male had left it was some time before the female appeared, and she flew directly to the young without paying any attention to me—I believe she is becoming accustomed to human beings. This time she left promptly after feeding the young, and it was too dark to distinguish whether she fed them in the same manner as the male. Neither parent appeared again for some time, when the male came, and after flying around for inspection as before, dropped to the roof a few feet away and on the opposite side of me from

the young. He then began quacking rapidly, precisely like an immature duck on a small scale, the sound being best spelled "pfat." Between intervals of quacking he would make a sound like the soft twanging of a bowstring, which he would repeat a number of times. The female joined him before long and, after waiting some minutes without results, I left them as it was getting late.

July 21. The primary pin-feathers of the young Nighthawks are about a quarter of an inch long. The birds are now eight days old, so their growth seems exceedingly slow for a small bird. The female flew around a little and then perched on a ridgepole in the same position as the male described in the first part of this article. The female has become so tame that I almost have to touch her before she will leave, and I have photographed her at a distance of three feet.

Ever since they were first hatched the color and actions of the young have been so similar to young quail, or grouse, that a few feet away it would have been difficult to distinguish a mixed lot. To be sure, the young Nighthawks do not pick food off the ground.

July 22. Visited the Nighthawks a little before dusk and found neither parent bird at hand, the young being at least seventy-five feet from where they were yesterday. I sat down against a chimney close to them and the female soon came, dropping to the roof about twenty feet away. She has grown so accustomed to me that evidently I am part of her daily routine, so she walked promptly to the young and fed them. This was done in a still different manner than before, as she at once thrust her beak far down their throats and fed them with the same violent pumping motion that is so familiar in the hummingbirds. After feeding both young in this manner, she settled down and allowed them to forage for remnants in her wide open mouth. After they had finished they crept in under her. The male came shortly after this, but he would not go to them while I was in sight. He is tamer than before, flying slowly within four or five feet of me and dropping to the roof only fifteen or twenty feet away, where he quacks.

July 24. Visited the Nighthawks in the morning this time, the weather being sunny and cool. The female is so tame that she

is hardly interesting. When I make her get off the young she simply squats on the roof a few feet away and dozes until I leave. The young exhibit an astonishing feather growth, as rapid as it seemed slow at first. Many of the smaller feathers on the wings look fully developed, where there seemed no sign of them on the 21st. I photographed them, but both young and adult are so exactly the color of the gravel that it is difficult to distinguish them. For several days now the young have been facing in opposite directions, side by side, as is the case with young humming-birds. One of them always has most of his body in plain sight, only his head being under the old bird. A most comical reminder of the fabled ostrich, who puts his head in the sand and believes himself completely hidden.

July 26. Visited the Nighthawks about 10 a. m. and found both young squatting together about a foot from the female; they were not facing in opposite directions today.

July 28. Visited the Nighthawks about 11.15 a. m., the weather is sunny, but not very hot. All three birds were in the same position as on the 26th, and I photographed the group at a three foot range. The young are getting well feathered and look more than ever like quail or grouse, and they can certainly run fully as fast, if not faster. When running fast they spread the wings occasionally, as when a day or two old, but do not flap, seeming to anticipate the aeroplane results that will come when they get a little older. The female parent is as tame as an old hen, and not nearly as fussy.

July 29. Visited the Nighthawks with Mr. Kitchin at 8.45 p. m. The two young were sitting close together, facing in the same direction, but neither parent was present. We sat down about twenty feet away, with our backs against a chimney, and awaited further results. It was some fifteen minutes before either parent appeared, during which time a flock of nineteen Purple Martins flew over "chirruping" lustily. This is much too early for them to be migrating, so we decided that they must be three or four families of young being taught to catch food by their parents.

The first Nighthawk to appear was the male, who flew close to us, but did not stop and did not appear again. Shortly after-

ward the female came and fed the least developed of the young, which I suppose is the younger of the two. Both young ran to her to be fed and, when she left, remained in a standing position. We walked up to examine them, when, to our astonishment, the older one rose in the air and flew over the edge of the roof. Naturally he seemed rather uncertain of his ability, for there is hardly a doubt that this was the first flight he ever made. I am positive that he was quite unable to fly yesterday. We peered over the edge of the roof and were again surprised to see him perched on a six inch railing about ten feet down—he surely must have circled in the air and come back in order to reach this. It seemed as if the parents would have a hard time finding him, and we felt that our prospects were cut in two, but we sat down again to watch and try to make the best of an unfortunate mistake. After about twenty minutes the female returned to the roof close to us and stood bobbing her head up and down, evidently being at once aware of the fact that there was one baby missing. The remaining young one never moved a muscle, a remarkable contrast to the usual antics when the parent comes with food, and it was evident that he either had not been given the signal to move, or else that he also felt that all was not right. Presently the female rose and circled low around the building, returning to the middle of the roof. She had scarcely alighted when the missing baby flew up over the edge of the roof and landed in almost the same spot where we found him in the early evening. If we were astonished at his first flight, we were dumbfounded at this. Never before had we seen anything to approach such intelligence in such a very young bird. It could hardly have been a mere accident, and I was at once reminded of the way one of the young had hopped in and out of the nesting place on the day it was hatched. As soon as he had alighted a signal was evidently given, and both young promptly flew to the parent and were fed, the younger one being scarcely able to raise himself off the roof. The feeding tonight was done, as for some days now, by the parent holding its beak far down the throat of the young and pumping violently.

It is most interesting to note the size and color of the young birds. The older one is as brown as a young grouse, while the younger is a pale gray. They are about two-thirds as large as

the adults, being just about the size of a Poor-will (*Phalaenoptilus*). The feathers of the primaries are not as long as they will be, but, otherwise, the older of the two seems to be a perfectly proportioned miniature of an adult bird though the coloring is different. They are very much stronger on their legs than the adults, and I wonder at what stage this agility begins to diminish.

July 30. Visited the Nighthawks at 11.30 a. m., the weather being cool and moderately sunny. Neither parent was present, or came in sight while I was there. Both young were side by side, facing the same way, and I took good care not to disturb them.

August 1. Visited the Nighthawks at about noon and found the female sitting between them, with a wing spread over each. The weather was warm and overcast, so I could see no reason for this protection. For some time they have had none of this protection on my visits, even when the weather was decidedly cool.

August 2. At noon today the Nighthawks were in the same position as yesterday, although there seemed no reason for it.

August 3. This morning I found the female sheltering only the younger of her babies, the older one having disappeared. This remaining youngster is fully feathered now, excepting for his short primaries and tail-feathers and is a beautiful little bird. Reddish brown, with broad smears of lavender and silver gray here and there in his plumage. About two-thirds the size of the adult, he reminds me more than ever of a Poor-will. If I had been hunting in the country and collected these two young birds I should have believed I had discovered a new species.

After considerable search I made out the absent young one on a neighboring roof, apparently perfectly at his ease. It is rather surprising that he stayed at home as long as he did.

Went up in the afternoon and found the home young one alone. Took his picture at two and a half feet range. Could see nothing of the other young one on the opposite roof. He is three weeks old today.

Went up in the evening at 8.15 and the home young one was alone, so I sat down to wait. For a while he was absolutely motionless; a Martin flying overhead chattering did not move him a particle. Then a Nighthawk passed over, high up, when he at once showed that he was not asleep, and how keen his eye-

sight was, by promptly looking up. A short time after this he commenced a series of gapings, which ended by his disgorging a large pellet, exactly in the manner of an owl. The light was beginning to fail now and he seemed more lively, stretching his wings and preening himself vigorously all over. He then walked away about ten feet and I went over to get the pellet, as I feared to lose it in the darkness. While I was looking it over the little bird took wing, circling some distance away from the house, but swinging around and alighting at the further end of the roof, some seventy-five feet away. I at once returned to my seat, and the small bird was almost equally prompt in flying back to the home roost. At three minutes of nine the female came and gave a very hurried feeding, followed about five minutes afterward by the male, who did likewise. It is the only time the male has dared to feed the young when I was close by and I doubt if he saw me this time, although very near. The young bird became very lively after this, taking numerous short flights, at one time going clear away from the building. However, he always returned to the home roost in the course of time, but every time I thought he must surely lose his bearings. It certainly is astonishing that such very young birds can have so much sagacity.

The manner of walking is now completely changed, the position of the body being horizontal instead of upright. This is, of course, owing to the long wing feathers making an upright position impossible. For the same reason, doubtless, the walking is much more labored and awkward, being almost exactly like that of the adult. Evidently this is the transition stage, where the feet and legs begin to lose their strength from lack of use, wing power being resorted to almost altogether. The female fed him once after this, when I left on account of darkness.

A close examination of the pellet disgorged by the young bird showed it to be nearly three-quarters of an inch long, by about a half an inch through. The contents consisted of the legs and other portions of soft insects and beetles, and ten pieces of clam shell. One of these pieces of shell was five-eighths of an inch long, which seemed a most formidable object to feed to a baby. Small wonder that it failed to prove digestible, making the disgorging of the pellet necessary.

August 4. Visited the Nighthawks this afternoon, when there was a slight rain. The female was beside the young one close to the wall, her feathers on one side up over him. He has certainly grown since yesterday and looks fully three-quarters as large as the old one. While I stood watching them he walked around in front of his mother and crawled in under her headfirst, boosting her clear over onto one side and leaving the greater part of him sticking out in front. It was a most amusing sight. He evidently did not figure that he had grown since his downy stage when he, the weaker of the two young, was always the one to be found with his head covered up. He is anything but a weakling now, but it is easy to see that he is still "the baby" of the family. How true the old saying is that, "One touch of nature makes the whole world kin."

August 5. Found the female sheltering the young bird today.

August 6. Found the young bird alone today, but both parents were flying around in the vicinity, although it was hot and the sun was shining brightly. They seemed to be gathering food and were as quick and certain in their movements as they are at dusk. This is the first time I have seen them hunting in the vicinity of the nest, as before this they must have gone a very considerable distance in order to get the kind of food required.

August 10. The young Nighthawk has been alone at all my visits during the day ever since August 6th. This evening I kept watch from the opposite sidewalk and about half past eight both parent birds appeared, repeatedly swooping down close to the roof and up again, as if trying to make the young bird join them. The female fed it but once, the male not at all. The male did a great deal of screaming, which is unusual of late, and at times swooped down past the female with the harsh "swuak" that very evidently took the place of singing during courtship. Occasionally the two adults joined by a Nighthawk with much shorter wings that I believe was, beyond a doubt, the other young bird. In direct flight he could do nearly as well as the old birds, but he fluttered considerably when making sharp angles and curves.

The performance on the roof looked interesting, so I went up at about 9 o'clock and nearly stepped on the young one as he was on the other side of the roof from the usual place. I sat down 'o

watch and both parents came, one at a time, and fluttered over him in a fruitless effort to make him join them. They would not feed him at all, but the most he would do was to flap along the roof. Finally they disappeared and the youngster, after waiting a while, took a long flight on his own account. He stayed away for at least a minute, and shortly afterward repeated the act, but I could not make out where he went, as it was getting dark and he did not fly above the skyline. While he was away the second time the male dropped to the roof very close to me and quacked a few times, which I think is a note of caution, but he soon stopped as he was not at all afraid of me now. The young bird soon flew past and dropped over in his regular place, when the male uttered a few times the soft note like a twanging string. After this, as far as I could tell, everything settled down for the night.

August 14. The young Nighthawk was a month (31 days) old yesterday. He was on the same place on the roof both yesterday and today, alone, as has been the case for some time. He was very wide awake and did not seem at all afraid of me, doubtless considering me a natural event in life. I wished to see how readily he would walk, or run, so approached within two feet, at which he stood up and gave a protesting screech. He did not attempt to walk, and I went no nearer as I feared he might fly and not return, which would spoil my study of how long he would stick to his home under normal conditions. Evidently the instinct to run, as a means of escape, is lost very soon after the power of flight is attained. The screech that he gave was very satisfactory as it proved that he was a male, as his gray plumage has led me to suspect.

August 17. The young Nighthawk was still on the roof, alone and in the same place.

August 18. Went on the roof today in the early evening and found no Nighthawks in sight anywhere. It seems probable that the young bird left last night, which would make him thirty-five days old at leaving the home roof.

I searched carefully for more ejected pellets, but found only one. This was exactly like the other and, although I have kept it unbroken, numerous bits of clam shell in it give evidence that the contents of both are much the same. It really begins to look

as if pieces of clam shell were given the young bird for medical purposes.

In summing up the above notes a few interesting contrasts and similarities may be drawn between the Nighthawks and some of their nearest relatives. The young resemble hummingbirds in their characteristics more closely than any other family, although differing widely in some ways. First, there are always two of them; second, excepting for a very short period, they are always fed by regurgitation, the food being violently pumped into them; third, for a very considerable period of time they sit side by side, facing in opposite directions, which is always the habit of young hummingbirds in their nest.

On the other hand the hummingbirds are born blind and absolutely helpless, so I think the most unexpected thing to me about the young Nighthawks was their strength, keen eyesight, and quick-wittedness as soon as hatched. In this respect, with the addition of the heavy coat of down, they are utterly unlike any of their near relatives with which I am acquainted. This applies especially to young woodpeckers, which are blind, entirely naked, and utterly helpless for several days after hatching.

Their actions and general resemblance, until their primaries began to lengthen, were so strongly suggestive of an abnormally smart young grouse that we must wonder what manner of birds their remote ancestors could have been. What could have happened in those early days to have transformed them, from sturdy legged runners, into one of the most graceful and spectacular of our flying birds. This transformation, as the young develop, is so sudden and complete that to the student of evolution it is the most interesting feature of all. The adult bird, although stronger on its legs than we might think, would be unable to keep pace for two seconds with a young one a week old.

From the actions of these two young ones, I believe that as a rule Nighthawks can fly about and gather food for themselves at the age of about one month, hardly any sooner, in spite of the fact that they can fly fairly well some days earlier. Although the last bird was thirty-four days old before he left the roof for good, there is no doubt that he was what, in human beings, would be called badly spoiled. He could fly perfectly well, but simply

would not work for his food so long as his parents would go and bring it to him. The first young one was only twenty-one days old when it left the home roof for good, although it could hardly have fed itself for some time afterwards.

Judging from the fact that one young bird was brown, I believe it was a female, while the one that was mostly gray I believe was certainly a male on account of his screech.

The call notes were very interesting, although the female made no sound beyond an occasional faint hiss. The quacking of the male is undoubtedly a warning call. I could not decide upon any meaning for his soft, bow-string note, but it was very musical and quite unlike anything that would be expected from a Night-hawk. The repetition of the courtship flight and song of the male to the female, when both old and young were flying together high in air, was surprising and interesting. His singing had stopped almost altogether after the eggs were laid, and during courtship I never saw the song flight when the female was in the air. The young at first have a faint chicken-like "peep," but discontinue it at a very early age and are very quiet.

I believe the food given the young must consist of soft insects, for the most part, as a careful examination of a large number of droppings revealed no signs of hard wing-cases or beetles. Neither were there any bits of clam shell, so it is possible that clam shell may be given to make the young disgorge the pieces of beetle found with it in the pellet.

The Woodstock, Tacoma, Wash.

THE HISTORY AND PURPOSES OF BIRD BANDING.

BY FREDERICK C. LINCOLN

The entrance of the Bureau of Biological Survey, United States Department of Agriculture, into the field of bird banding will be viewed with interest by the students of this method of ornithological research. In the present paper the author endeavors to present a brief review of the subject from the historical aspect and to outline the problems that it is hoped will be solved by this method of investigation.

In studying the literature of earlier days, casual notes are found relative to the marking of a bird or brood for the elucidation of some pertinent question. This would indicate that the possibilities of such a means of study were not totally unappreciated by the early naturalists but the methods that they employed were too crude to produce important results. Flight or tail feathers were marked with indelible ink or paint; thin metal discs were glued to these feathers; parchment memoranda were tied to some part with silk thread; or the feet, bill or plumage were mutilated in a distinctive fashion.

Obviously none of these practices was satisfactory; and in many cases could, at best, last only until the succeeding molt. The general neglect of the tarsi for the attachment of identifying insignia seems particularly surprising today, since it is now readily apparent that no other part of the bird's body is so satisfactory to carry these marks. The first record of a bird marked on the tarsus that has come to my attention is that of a Great Gray Heron (*Ardea cinerea*) captured in Germany in 1710 carrying several metal rings, one of which (so the reference states) had been attached in Turkey several years previous. This record is interesting and it is regretted that full details are not available. Moreover, since this appears to be the first use of a metallic ring for this purpose, it would be a matter of considerable interest if the kind of metal were known. Nickel and aluminum were not extensively worked at that period and it therefore seems probable that silver was used, as neither iron nor brass would have lasted for "several years" on the foot of a bird that spent so much of its time in water. In subsequent investigations these two metals were used, with precisely the result that should have been expected, rust and corrosion to the total destruction of the bands.

In 1804, a Dutch naturalist, Brugmann by name, undertook to mark a number of White Storks (*Ciconia alba*) in an effort to learn whether they habitually returned to the place of their birth. His manner of marking is not known but as his birds returned (if they did) without the marks, nothing was gained. The only importance that can attach to this experiment is the fact that in the latter part of the same century the White Stork again figured in one of the most important of modern European investigations in bird migration.

Following this, a few sporadic attempts at bird banding were made by European investigators, but nothing of importance was done until 1899, when Herr Chr. C. Mortensen, of Viborg, Denmark, commenced to band and systematically to record Storks, Teals, Starlings and two or three birds of prey. Herr Mortensen may well be called the pioneer in scientific bird banding.

Stimulated by the success of the Danish ornithologist, bird banding in Europe came rapidly into prominence, so that by 1914 eighteen or twenty distinct projects were either in full operation or were about to be started. Few countries were without their representative schemes and but for the outbreak of international hostilities important results might have been achieved through the coordination of their activities. These were located and had their date of origin as follows: The German Ornithological Society's bird observatory at Rossitten on the Baltic, began banding operations in 1903 under the direction of Prof. Dr. J. Thienemann; and the Royal Hungarian Central Bureau for Ornithology started its work under the direction of Jacob Schenk at Budapest the same year. In 1904 the German Society established a second observatory at the naval base of Heligoland in charge of Herr Weigold. Prof. A. Landsborough Thomson began work in Scotland under the auspices of Aberdeen University in 1909, and the project of 'British Birds' magazine, under Mr. H. F. Witherby was inaugurated that year, as was also one in Russia under the direction of the Natural History Society, at Riga. Señor W. C. Tait at Oporto, Portugal, also commenced to band birds in 1909 but apparently did not press his work to any great extent.

In 1910 the Bavarian Ornithological Society and the Kroatian Natural History Society undertook banding work, and in 1911, Herr K. Daut, at Bern, Switzerland, and the Biological Society at Gothenburg, Sweden, started similar investigations. The latter of these was subsequently taken over by the Royal Natural History Museum, at Stockholm. In 1912 the Prussian forest officers were authorized by the Ministry of Agriculture, Lands, and Forests to band birds; and in 1913 Herr Tratz founded an ornithological station at Salzburg, where banding was carried on. The year 1914 seemed to dawn auspiciously for investigations of this character, as no less than four distinct projects were either

started or considered for future development. First the station of "Lotos" at Libock, in Bohemia, was founded; then the Leyden Museum took up the work in Holland under the guidance of Dr. Van Oort; the Imperial Russian Acclimatization Society for Plants and Animals founded an association at Moscow to mark birds; and Dr. Menegaux, of the French League for the Protection of Birds, outlined a plan for the consideration of that organization.

From the available figures these different organizations succeeded in banding approximately 170,000 birds. No complete records of the 'returns' received have been compiled but it would probably be about 3 or 4 per cent, or from 5,100 to 6,800 birds.

The history of bird banding activities in America is more or less known to the members of the A. O. U., because of the various papers on the subject that have appeared in 'The Auk.'¹ In these papers are mentioned the early experiments of Audubon, the work of Mr. P. A. Taverner, of Dr. John B. Watson, at Dry Tortugas, of the New Haven Bird Club, of Dr. Paul Bartsch, near Washington, D. C., and, in addition, several of the foreign projects outlined above.

As the immediate result of this pioneer work and through the efforts of Dr. Leon J. Cole, the American Bird Banding Association was formed in New York City, December 8, 1909, with a charter membership of over thirty.

This organization under the able guidance of its secretary, Mr. Howard H. Cleaves, continued to advance the work. From the fall of 1911 until early in 1920 it was conducted under the auspices of the Linnaean Society of New York, but in the latter year, having outgrown the available resources, it was formally taken over by the Bureau of Biological Survey of the U. S. Department of Agriculture.

Beginning in the year 1914 one of the most interesting chapters in the history of American bird banding activities was written

¹ The more important of these are: "Suggestions for a Method of Studying the Migration of Birds." By Leon J. Cole, Third Ann. Rept. Mich. Acad. Sci., 1901, pp. 67-70. "The Tagging of Wild Birds as a Means of Studying their Movements." Leon J. Cole, Auk, XXVI, No. 2, April, 1909, pp. 137-143. "The Tagging of Wild Birds: Report of Progress in 1909." Leon J. Cole, Auk XXVII, No. 2, April, 1910, pp. 153-168.

"What the American Bird-Banding Association has Accomplished During 1912." Howard H. Cleaves, Auk, XXX, No. 2, April, 1913, pp. 248-261.

by Mr. S. Prentiss Baldwin, of Cleveland, Ohio.¹ By means of traps of various types he conclusively demonstrated that through an efficient system of trapping a much larger percentage of "returns" might be secured than had been possible in the past when the killing of the bird had been depended upon for the recovery of the bands. Mr. Baldwin's experiments were carried out at his farm near Cleveland and at Thomasville, Georgia, and both of these stations are still in operation.

Turning now to a discussion of what may be learned through this method of investigation that is not possible by any other, we note at the outset that we are approaching the various questions from the aspect of the individual bird. We have each case complete in itself and by the coordination of many of these cases we can proceed to broader generalities. The 'return' record of a banded bird indicates that there were at least two times in its life when its whereabouts could be stated with precision. It therefore becomes axiomatic that the data secured from banded birds are incontrovertible. This evidence will bear on the problems both of migration and of life history.

Considering the former of these subjects and it will be noted that there is much mystery associated with the phenomenon of migration, which from the viewpoint of our present knowledge, can not be solved because of the lack of certain data.

To illustrate: The general speed at which a species advances or retreats during its periodic movements has been computed by means of the observations made by competent observers at different points along the route. But the exact number of miles that any one bird will travel in a day's journey, has not been ascertained, due, of course, to the impossibility of keeping the individual under observation. Moreover, it is not known whether any one flock or group of birds continually remains in the van, or whether the advance is made in a manner comparable to a game of leap-frog, successive groups 'jumping' over each other in alternate periods of rest and flight. The study of these so-called bird waves has attracted much attention in the past and their associ-

¹ Bird Banding by Means of Systematic Trapping, by S. Prentiss Baldwin, from abstract of Proceedings, Linnaean Society of New York, No. 31, 1919, pp. 23-56.

ation with meteorological conditions has been more or less generally accepted. Banding records should elucidate this question and show accurately just what this relationship really is.

Again, to what extent do the individuals of a species follow the same route of migration in successive years, and is it the same for both spring and fall journeys? The importance of this question will be evident when it is considered that in the case of migratory waterfowl, the open seasons for shooting are during the time the birds are either on their winter feeding grounds or en route thereto. Consequently, data of this character will have an important bearing upon the enactment of appropriate laws for their protection.

Among other unanswered questions bearing on the subject of migration is whether those members of a species that breed farthest north, winter farthest south; in other words, whether they 'jump over' those members that breed in the intermediate zone which latter either make a much shorter migration or do not migrate at all. An observer at one point sees a general southward movement in the fall, while another, situated several degrees nearer the equator, finds the species stationary or at least present every month of the year. But the latter observer is unable to be sure that he sees the same birds continually in his latitude, nor is there any way in which he can decide this except by marking them. It is a well-known fact that with several species the young migrate separately and at a different time from the adults. This being true, do they segregate themselves to the extent of occupying different winter quarters? At this season the plumage is not always a safe criterion of age, and even the age of the bony structures can be determined only by an experienced anatomist.

Consideration of this last question will at once bring to mind the unsolved problem as to how long the individuals of any species remain on their winter feeding-grounds or in their breeding area, or how much time is consumed in travel between these two points. Neither is it known whether the individuals of all species return with regularity to winter in the same area. All these questions may be answered through trapping operations, since the birds frequenting any station will be registering ('repeating') their presence almost daily, and the dates of arrival and departure may therefore be stated with exactitude.

Another question that still awaits a satisfactory answer is: To just what extent and in what species, if not in all, is there a return to the site or vicinity of the nest of the previous year? Popular belief and some observations credit birds with an affinity for the old nest, but while it must be admitted that the theory is not untenable, it is by no means completely proved. Furthermore, if this theory be accepted in its entirety, consistency would demand the additional belief in the permanency of matings. If this hypothesis be rejected while still retaining the former, we are immediately confronted with the query as to which one of the pair is drawn by the magnet of the last-year's nest-site.

And what is the reason the young birds do not return (if true) to the region of the parental nest? Is the mortality heaviest among these yearlings, are they engaged in colonizing new districts near by, or do they constitute the vanguard of their species in the gradual extension of their range? Certain it is, that under normal conditions the avian population of an area is practically stationary. It has been found by actual count over a period of years that the number of breeding pairs will vary but little. Therefore, what becomes of the numerous offspring? As a suggestion, it may be that they winter in a different area from the adults and in going northward the next spring they enter a region *at a considerable distance* from that of their birth. They may even enter the territory of a different variety of the same species, or, on the other hand, they may strictly observe the confines of their own race and return to breed in the general vicinity of their own parental nest. The data that solve this problem may therefore have an all-important bearing on the subject of evolution with particular reference to the development of geographic races. Such information should also throw light on the effect of winter as well as summer environment on plumage changes.

The second group of problems on which data will be secured through this method of investigation is concerned with life histories. It will be at once apparent that the life histories of banded birds will be unique since in each case the information will pertain to a particular individual or a particular family.

Probably one of the most interesting subjects under this heading is the aforementioned permanency of matings. Mr. S. Pren-

tiss Baldwin has already studied the marital relations of the House Wren as presented elsewhere in the present number of 'The Auk,' and his conclusions may or may not be found to apply to other species. This theory, together with the supposed affinity for the nest site of the previous year, has gained considerable credence in the public mind, and while confirmatory proof is not entirely lacking, a great quantity of corroborative evidence is still needed before it can be completely accepted. Evidence on this subject may easily be collected with regard to those species that have shown a preference for nest boxes, since the banding of the entire family is comparatively simple, the nest box being readily converted into a temporary trap. Both the parents and their brood should be banded, and this should be done when the young are so well grown that there will be no danger of the parents' deserting them.

Although the banding of nestlings should be practiced at every possible opportunity there are certain features of this phase of the work that make it a less efficient method of operation than the systematic trapping of adults. One of the greatest disadvantages of the former method, is the high mortality rate among young birds. Probably the most precarious time in a bird's life is the period immediately after it leaves the nest. It has been estimated that only about 50 per cent of the young hatched actually reach maturity. It is therefore apparent that if this be true, many bands are wasted, and in addition, the record files contain many original data from which there can be no hope of returns but which must nevertheless be retained. An obvious advantage, however, is the collection of specimens of known age that will eventually be secured and which will be of incalculable value in studying the sequence of plumages and as an aid in determining the longevity of the individual. In banding young birds due regard must be given to their age. Young recently hatched should not be banded except under very exceptional circumstances; rather, the operator should wait until they are practically ready to leave the nest. At this time their tarsi will, in most cases, be fully grown or even over-grown, so that no allowance need be made for future growth.

The distance that birds will range from their nests in foraging for food has never been determined, and it should be a matter of

considerable interest. These data might be obtained from two or more adjoining trapping stations, or from one station alone if the operator would endeavor to locate the nests of the birds that frequent his traps. This information would also show the number of feedings per day and the preference of both adults and young for certain kinds of food. During the winter months birds are generally considered as more or less stationary, and it would be interesting to learn just how far they will wander from a known source of food supply. Visual observations in this case would supplement the trap records. The time spent in various activities is another item of interest in the study of life history, and the operator of a trapping station will have special opportunities to acquire such information.

The establishment of trapping stations is comparatively simple. Throughout the country there are many persons who feed the birds during the entire year. It will be seen that each of these feeding stations may readily be transformed into a trapping station without in any way detracting from its value as a source of avian food supply. It has been the observation of the author that if carefully handled, birds are neither injured nor unduly alarmed by being trapped. It is true that they are likely to struggle in the hand and some firmness is necessary to prevent injury, but the fact that many banded birds not only return to the trap, but do so again and again, is sufficient evidence that the treatment they received did not give them the fright or injury that some fear will result from this work.

While on this subject, the merits of the question as to the relative harm done to bird life through such operations may well be discussed. Occasionally birds will be injured or even killed through accidents in the trap or through careless or inexperienced handling, but such occurrences are so rare that they may be totally ignored. A band properly placed causes neither harm nor discomfort to the wearer. The word 'properly' must be emphasized, for an improperly placed band may readily cause trouble. If placed too tightly it may stop the circulation in the foot and so bring about a condition of paralysis; if placed too loosely, it may become caught on thorns or twigs. (This latter is applicable only to very small birds.) But the careful operator will rapidly

acquire such skill in handling the birds and in placing the bands that the number of casualties will be negligible.

There is absolutely no danger of bird banding leading to promiscuous slaughter. This is obvious when it is considered that no matter how complete the system or how enthusiastic the operator, the actual percentage of banded birds to the entire avian population will always remain so small that shooting for the sole purpose of securing banded birds would be ridiculous. Even on ducks and other large birds for which comparatively large bands are necessary, the bands are too small to be distinctly seen at the usual distance of observation without the aid of excellent field glasses under the most favorable conditions.

Although the bands used are considered as permanent marks, the use of the term 'permanent' must be qualified, since the habits, size, and relative strength of the different species will have a very important effect on the permanency of any artificial mark. For example, the use of an aluminum band on river ducks that spend the most of their time in fresh water, may be considered practically permanent, but with the salt-water diving ducks, the case is different. Alkalis attack aluminum in a manner comparable to the action of acid upon iron or copper, and in consequence the endurance of aluminum bands carried by waterfowl will be in inverse ratio to the length of time the birds spend in salt water. As an instance of this character I may mention that I have examined several bands that had been carried by ducks of various species for three or four years. The bands on those birds that followed the Mississippi valley as a migration highway and that nested near or on fresh water showed but ordinary wear, while those carried by the ducks that frequent Great Salt Lake, for example, were eaten away to the point of total obliteration of number and legend. In addition, crows, jays, and some of the larger finches are almost certain to make every effort to remove the band, and the stiffness of the metal or the locking device must therefore be of such nature as to defy their strength and ingenuity.

Nevertheless, it may be assumed that for this purpose aluminum bands are practically permanent. Therefore, the subjects for serious consideration are the methods of securing the birds for banding and for the return of the bands. Heretofore, by far the

greater number of birds banded have been fledglings and the 'returns' have been obtained through the chance killing of the bird at a later period by some person with sufficient knowledge and interest to comprehend the meaning of the band and to forward it to the proper authorities. That this method has not been devoid of results, we know, but the percentage of 'returns' has been low, and furthermore, there are but two positive dates, that of banding and that of capture, which latter has almost invariably meant the death of the carrier. With some species, it is still believed that this procedure will have to suffice to a considerable extent, for in the case of migratory game birds there can be no question that many of our 'returns' will be sent in by sportsmen. But even with these more systematic methods are possible.

In conclusion it may be stated that a variety of methods must be employed for no one system will apply to all cases. For many of the ground-loving species the Government sparrow-trap, with slight modifications, has proved excellent. Other sparrow traps now on the market have not been extensively tried but probably many of them may be successfully used. The use of some device for throwing a net over a baited area, and thus catching an entire flock, should prove particularly satisfactory for those birds that have a distinct aversion to going under anything, such as shore-birds. For ducks and other waterfowl, still different schemes must be employed, but satisfactory traps are too well known to allow any doubt as to the success of the operator who works with these birds.

The use of the 'jack-light' has scarcely been tried in this country, but it might be a most successful method of operating in breeding colonies of Herons, Ibises, Gulls, Terns, Pelicans, and other birds with the communal habit.

With the element of anticipation always present, expecting and watching for a bird marked at some other station or during a previous year, it seems that this new system of bird banding should find a host of enthusiastic participants. The Biological Survey is prepared to assist in the construction of traps, with information about those that have been successfully operated, and will issue the bands and forms to be used in recording the data.

Special Federal permit for this work is required under the provisions of the Migratory-Bird Treaty Act. Application for permit and full information relative to the work may be secured by addressing the Bureau of Biological Survey, U. S. Department of Agriculture, Washington, D. C.

Biological Survey, Washington, D. C.

RECENT RETURNS FROM TRAPPING AND BANDING BIRDS

BY S. PRENTISS BALDWIN

1. OPERATIONS AT CLEVELAND, OHIO.

The methods used by the writer, for trapping and banding birds have been fully explained in an article published by the Linnaean Society of New York in 1919.¹ Briefly it may be explained that by means of the so-called Government sparrow-trap, and by the use of trap nest boxes, adult wild birds are caught, aluminum bands bearing address and numbers for identification are placed on the legs of these birds and they are then released. During the last six years many hundreds have been thus banded and many thousands handled by the writer; and many have been re-taken again and again the same season and succeeding seasons.

The publication above referred to contains, besides a description of methods, a report of the returns of birds to and including the year 1918. The following report includes only the "returns" of the years 1919 and 1920. Those who have a copy of the previous report may be interested to know that three of the birds described therein, were taken three years later, in 1920, and appear in this report. These are Brown Thrasher, number 19247; Red-bellied Woodpecker, number 31778; and White-throated Sparrow, number 38160. An additional report for House Wren number 44008 is also contained in the following pages.

Handling Wild Birds.—Two positions for holding birds are described and illustrated on page 27 of the 'Proceedings.' Per-

¹ Proceedings of the Linnaean Society of New York No. 31, 1919.

haps I should have described also the simple process of changing a bird from one position to the other without danger of flutter or escape; i. e., to pick the bird up by the head. It sounds barbarous and you expect the bird to hang himself, or pull his own head off, but it is really a very satisfactory method and does not harm the bird in any manner. One soon learns a knack of handling birds quietly, in banding, changing position, or examining, and indeed in a few moments the bird is so quieted that one may open the hand flat, and sometimes even roll the bird back and forth on the open palm without any attempt on its part to escape. Then suddenly it goes like a shot, so quickly that one cannot see how it is done.

I have not had such abundant returns at Cleveland as I find in the work in Georgia. In the latter region it is an intensive work, taking many birds in a short season of a month or six weeks, during the high point of spring migration, with a high percentage of returns. But in Cleveland I miss the spring migration, and get only the local residents during the summer and the fall migration of the various native sparrows.

Considering the larger percentage of returns in Georgia of Myrtle Warblers and Chipping Sparrows, some of them not only one year but two and even three year returns, the results in Ohio are astonishing for their meagerness. Autumn after autumn I have banded many migrant White-throated and White-crowned Sparrows, and have never had one back the next year. This does not mean that it is useless to band these sparrows, for the banding does give information of their movements from day to day and the dependence of those movements upon the weather.

To What Extent do Birds Return?—Of 156 House Wrens handled in five years 10 returned, or about six and two-thirds per cent. This figure may be considered fairly accurate though probably below the real number returned, as some no doubt escaped me. Of the total number of birds of all kinds banded at Cleveland, prior to 1920—some 1200, 36 have returned one or more years, or 3 per cent. This figure is of birds actually taken, but as many of the birds on my lists are species that do not come to the traps, and many others likely return and nest nearby, but are not taken in the traps during the season; the figure is much too low. Prob-

ably ten per cent may be about a correct estimate of those which survive and return to within 500 yards of last year's site.

The percentage of returns in Georgia seems to run higher than ten, and likely so since all are adult birds when banded.

There is no doubt that, on an average, as many birds of any species die each year, as are raised that year; but it seems probable that the death rate is higher among the young birds of the year, than among adults. This death rate must be considered in any estimates of the tendency of birds to return; and estimates of the *average* life of birds.

Do young birds return to the same spot?—They do, sometimes. I have had several examples, but especially Robin 32932 and House Wren 45325, both banded in the nest so that there was no question as to their youth.

Birds banded in 1919 and 1920.—Total birds banded since 1914, 1064; of which 156 were banded in 1919 and 376 in 1920.

Migration. During the autumn of 1919 illness prevented my observations. In 1920 the weather was mild and uniform during the entire months of September and October, with no sharp storms. The birds therefore drifted in and out, without the distinct wave movements seen in more stormy years. The White-crowned Sparrows exceeded the White-throated Sparrows in number this season, while unusually large flocks of Chipping and Field Sparrows were present in October.

Return of birds banded in previous years.—

32932. ROBIN (*Planesticus migratorius migratorius*).

1917. Banded May 15 in the nest.

1919. Taken March 19 in the greenhouse. A positive return of a young bird.

29863. CATBIRD (*Dumetella carolinensis*).

1916. Banded June 22, at station B.

1917. Taken June 21, at station A.

1919. Taken June 21, in the greenhouse.

45399. SONG SPARROW (*Melospiza melodia melodia*).

1919. Banded October 7, at station A.

1920. Taken June 4, 6, 7, 10 (twice), 15, 18, 27, 30, July 9, 13, August 1 (with young 46081 and 46082), 2, 4, and 5. Always at station A although stations B and C were only 100 yards away.

45359. SONG SPARROW (*Melospiza melodia melodia*).
1919. Banded July 18, at station A (marked "young").
1920. Taken July 31, at station A.
53035. BROWN THRASHER (*Toxostoma rufum*).
1919. Banded May 16, at station B. Taken June 7 (at A), and 11 (at B.).
1920. Taken June 15, at station B.
53038. BROWN THRASHER (*Toxostoma rufum*).
1919. Banded June 10, at station B. Taken June 21 and 29 and July 25. All at B. Accompanied, June 10 by young 53039 and on July 25 by young 53056 which would seem to have belonged to a second brood.
1920. Taken July 26, and July 22 (twice) always at station B. Accompanied July 26 by young 53928.
41273. BLUE JAY (*Cyanocitta cristata cristata*).
1919. Banded May 13 with 41272.
1920. Taken July 11, at station B, with 53926.
38643. CHIPPING SPARROW (*Spizella passerina passerina*).
1916. Banded September 12.
1920. Taken September 25, at station E. Had a swollen hind toe on right foot. Taken again October 7 (at E) and kept over night in a cage to show to Dr. Chapman and Mr. Fuertes who visited the place on October 8.

It had been four years since I had seen this little fellow. Coming at the same time in both the years that I caught him, and with flocks of others, I believe this bird was migrating and had just stopped en route.

Returns of House Wrens at Cleveland.—In the case of House Wrens I am able to band each year practically every individual, old and young, on the place, and can trap each year practically every adult so that a much more accurate and definite record of these birds can be secured than that of those caught in the other bird traps which are dependent largely on chance. During the past two years I have been more careful of the Wren record than formerly, but even so, a few may have escaped me during my absence from the farm. The summary of Wren banding and examination for the several years is as follows; all "new" birds being banded each year.

1914. Banded 12 individuals. No returns from these.
1915. Banded 44 (5 adults and 39 young). One adult, 27739, was retaken in 1916. (see Linnaean Proceedings, p. 52).

1916. Examined only 7 (2 adults and 5 young). One adult was a 1915 bird as above stated. Had no time for the work this year.
1917. Examined 22 (6 adults and 16 young). One of the birds banded this year 44008, was retaken in both 1918 and 1919.
1918. Examined 27 (9 adults and 18 young). Four of the adults banded this year were retaken in 1919.
1919. Examined 44 (12 adults and 32 young). Four of the adults and 1 young banded this year were retaken in 1920.
1920. Examined 51 (13 adults and 38 young).

Summing up the results: Of the 156 individuals handled from 1914 to 1920 (not including 1920) ten have returned, nine of them being adults and one a young bird while one bird has appeared a third year.

Returns of House Wrens in 1919 and 1920.—

45206. HOUSE WREN (*Troglodytes aedon aedon*).
1918. Banded July 14 at Box 47.
1919. Taken June 17 at Box 26.
44008. HOUSE WREN (*Troglodytes aedon aedon*).
1917. Banded July 4 at Box 51.
1918. Taken at Box 51 June 19.
1919. Taken June 17 at Box 19.
44100. HOUSE WREN (*Troglodytes aedon aedon*).
1918. Banded June 19 at Box 51.
1919. Taken June 17 at Box 19.
44526. HOUSE WREN (*Troglodytes aedon aedon*).
1918. Banded June 23 at Box 40.
1919. Taken June 24 at Box 40.
45335. HOUSE WREN (*Troglodytes aedon aedon*).
1919. Banded June 24 at Box 63.
1920. Taken June 15 at Box 49 and July 7 at Box 63.
45303. HOUSE WREN (*Troglodytes aedon aedon*).
1919. Banded at Box 25 June 17.
1919. Taken July 20 at Box 53.
1920. Taken June 17 at Box 25 and July 29 at Box 25.
45342. HOUSE WREN (*Troglodytes aedon aedon*).
1919. Banded June 26 at Box 53.
1920. Taken June 17 and July 29 at Box 25.
45325. HOUSE WREN (*Troglodytes aedon aedon*).
1919. Banded June 19 as a young one in Box 3.
1920. Taken July 7 and 28 at Box 59.

45349. HOUSE WREN (*Troglodytes aedon aedon*).

1919. Banded July 4 at Box 53.

1919. Taken July 20 at Box 53.

1920. Taken July 13 at Box 47.

II. OPERATIONS AT THOMASVILLE, GEORGIA. 1920.

What old friends among the birds may one expect to meet after an absence of three years? How many have died? Is it not an axiom that in each species about as many die every year as are raised in that year? How many have strayed? How many still live in exactly the same old haunts or return to the same spots to spend the winter? These are some of the questions that bird banding may be able to answer and those who have read my previous account of bird banding at Thomasville, Georgia (Proc. Linnaean Society of New York, No. 31, for the year 1919) will understand the interest with which I returned to Thomasville in February, 1920 after an absence of three years.

In the three seasons previously spent here I banded 542 birds as follows:

1915.	Resident birds	27.	Migrants	63.	Total	90.
1916.	"	"	44.	"	169.	" 213.
1917.	"	"	24.	"	215.	" 239.
		—		—	—	
		95.		447.		542.

In 1920 11 of these birds were taken again in the traps, seven residents or more than seven percent and four migrants or nearly one per cent. In the five traps 723 individual birds were taken in 1920. Of these 283 were new birds and were banded this season while 440 captures represent recaptures of these same birds or of the eleven banded in previous years. Of the new birds 232 were migrants and 51 residents.

The migration began in earnest among the Myrtle Warblers and Chipping Sparrows in the second week of March, the movement being clearly shown in the number of birds handled in the five traps, only 86 being taken in February while 637 were taken in March. Mr. Frederick C. Lincoln in charge of the bird banding work of the U. S. Biological Survey, visited me in Thomasville, March 20 to 24 and during these five days we handled 222 birds among which were Blue Jay 31772 of 1916 and Myrtle Warbler

27440 of 1917. There was a joyous reunion when Brown Thrasher 19247 appeared. Although the early history of this bird has been given in the 'Linnaean Proceedings,' p. 35, it is desirable to republish its record in full, along with that of another 1917 bird retaken in 1920.

19247. BROWN THRASHER (*Toxostoma rufum*).

- 1915. Banded February 27 and taken again March 13. It was the mate of 19246 at station A and was always shy of the trap although 19246 always entered it.
- 1916. Taken March 4, 11, and 17. It was again the mate of 19246 and each bird had the same attitude toward entering the trap as last year.
- 1917. Taken March 11 with 31783 which was believed to be its mate this year. The former mate 19246 has not been taken since 1916. Taken again alone on March 12 and 13.
- 1920. Taken February 16, 20, March 8 (with 53085), and March 11. This year as before always at station A. May we not consider 53085 its mate for this year? 53085, by the way, has the left leg off at the mid-tarsus and well healed into a button. My conscience troubled me as I feared it might possibly have been the band that caused him the loss of his foot and that he might be the same mate as last year.

40796. BROWN THRASHER (*Toxostoma rufum*).

- 1917. Banded March 2. Taken March 8 with 31779 and alone on March 19 always at station D.
- 1920. Taken March 16, 20 and 21 (with 53092) always at station B, two-hundred yards from station D.

Brown Thrashers are classed as permanent residents, not meaning to imply that any one individual may not be a migrant, but they are mated and nesting in March so that it seems fair to assume that two caught together are mates. Other 1920 records follow.

1916. BLUE JAY (*Cyanocitta cristata cristata*).

- 1916. Banded March 28 at station A.
- 1920. Taken February 15 at station A.
- [1921. As this paper goes through the press this bird was caught again, March 6 (Sta. AA). It is now at least six years old.]

31772. BLUE JAY (*Cyanocitta cristata cristata*).

- 1916. Banded February 27 at station C.
- 1920. Taken March 23 at station A.

41897. BLUE JAY (*Cyanocitta cristata cristata*).
1917. Banded March 12 at station B.
1920. Taken February 27 at station C and March 3 at station A.

Blue Jays are classed as permanent residents and these returns of three birds from a total of 21 banded in the three years, 1915-1917, bear out the belief that they remain closely at home.

31778. RED-BELLIED WOODPECKER (*Centurus carolinus*).
1916. Banded March 7. Taken March 11, 19, 21, 22, and 24 at stations A, B and C.
1917. Taken March 9 at station B and March 11 at station C.
1920. Taken February 16 at station B, 19 (at B), 23 (at A), and 25 (at B).

This bird is a good old standby already published in my original report, p. 40. These woodpeckers feed on the ground much as the Flickers do, which accounts no doubt for their coming to the bread and grain bait.

32197. CARDINAL (*Cardinalis cardinalis cardinalis*). Female.
1917. Banded March 20 at station C.
1920. Taken February 13 at station C.

An unusual number of Cardinals, both males and females appeared all through March and I banded 29 new ones, though I had banded only 36 all told in the three seasons, 1915 to 1917. Could they be migrants?

16246. HERMIT THRUSH (*Hylocichla guttata pallasi*).
1917. Banded February 28 at station AA.
1920. Taken February 23 at station AA.

It was rather a surprise to get a Hermit Thrush, as I had banded only four—three in 1917 and one in 1918. I suppose this bird was migrating.

27290. MYRTLE WARBLER (*Dendroica coronata*).
1917. Banded February 28 at station C.
1920. Taken March 7 at station C and March 11 at station D.
[1921. As the paper goes through the press this bird was caught again, March 1 (Sta. D) and March 3 (Sta. B). It is now at least five years old and has made four trips to the north since it was banded.]

27440. MYRTLE WARBLER (*Dendroica coronata*).
1917. Banded March 1 at station C. Taken March 2 (at C and D), 3 (at C and D), 4 (at C), 5 (at D), 7 (at D).
1920. Taken March 19 at station C, 22 (at D), 23 (at B).
This bird happily remained over from the 19th to the 23rd to greet Mr. Lincoln.

The taking of the same Myrtle Warbler in your hand after an interval of three years during which time the tiny creature has made three long trips to the far north certainly arouses your sentiment. To be sure I have banded many of these birds, 64 in 1917, 55 in 1916 and 15 in 1915, and have had numerous returns after one year or even two years but to capture these two birds after so long an interval was very gratifying.

In former seasons Myrtle Warblers have apparently wintered at Thomasville, at least they have been very plentiful in February, and would be mostly gone further north before the Chipping Sparrows came up from farther south; the second week in March; but this year the Myrtle Warblers seemed to come at the same time as the Chipping Sparrows appearing in flocks about March 6.

38160. WHITE-THROATED SPARROW. (*Zonotrichia albicollis*).

1916. Banded March 5 at station A. Taken March 6, 7 and 16 at the same station.

1917. Taken March 7 and 19 at station A.

1920. Taken February 25 (at AA), 27, March 2, 3 and 6—all at station A and March 22 (at AA.)

The taking of this bird is of interest not only on account of the history of the individual but because in my opinion it identified this group of White-throats as the same group that has been found in the same patch of shrubbery at the end of the house, station A, ever since 1915. This year the group seemed smaller, apparently only half a dozen individuals, while previously there had always seemed to be two dozen or more. In 1915 I banded twelve of these, two were re-taken in 1916 and one other in 1917. In 1916 I banded six, and of these four were re-taken in 1917. In 1917 I banded eighteen. In 1920 I banded only six.

I believe this is one and the same group of these birds that I first found here in 1915, a continuous though ever changing group as some die, young birds are added, some in mating go outside the group, and others mating come into the group. During February and March they remain closely together, feeding now on one side of the house, now on the other side, but always to be found somewhere at Station A. I believe these birds travel not as single pairs of mates but as a group of relatives and neighbors, year by year, from the same spot in winter, to the same spot in

summer and return. I call attention to this as a "neighborhood group" not as a proposition proved, but to suggest it as probable, and something which may be proved by this method of study.

Chipping Sparrows (*Spizella passerina passerina*). After having Myrtle Warblers return after three years, I did hope for one or two Chipping Sparrows but did not get a single one though I had banded 266 of them in the three years, 1915 to 1917. Among the new Chipping Sparrows only eight of the 110 banded had swollen toes, but it is probably only by chance that this does not equal the ten per cent, found in former years. But why do Chipping Sparrows have so great a proportion of diseased toes, while the condition seems never to be found in other birds?

Individuality in Birds.—The behavior of the individual when handled is interesting. The Cardinal nearly always screams and squeals and fights with energy, yet four of the twenty-nine handled in 1920 are marked to have squealed very little. This is not an accident of the moment, for the same bird will act the same way every time it is handled. Myrtle Warbler (45490) taken six times squealed every time, though no other Myrtle Warbler of nearly 200 handled has squealed in my hands. Of the hundred or more Chipping Sparrows handled this year five only have squealed in handling.

Of about the 730 birds trapped in February and March only six were killed, and these by shrikes or hawks, but many more would have been destroyed if we had not watched the neighborhood with a gun.

2930 Prospect Ave., Cleveland, Ohio.

THE MARRIAGE RELATIONS OF THE HOUSE WREN (TROGLODYTES A. AEDON).

BY S. PRENTISS BALDWIN

INTRODUCTION.

The belief that most birds mate for life and each year return to the site of the previous nest to rear their young, is very old, and in the popular mind it is probably more or less generally accepted. The following data will have a bearing on this matter

and will also throw additional light on the interesting subject of incubation periods.

It was in the spring of 1915 that I began the use of trap nest boxes and numbered bands for the house wrens on my farm near Cleveland, Ohio, and made the interesting discovery of my first 'wren divorce.'¹ This pair, having successfully raised one brood together, separated, and each secured a new mate for the second brood of the same season. The question that was immediately presented by this action was: is this exceptional or is it a matter of regular occurrence with this species?

Since then I have used increasing care to take the adults of each season and to band both them and their young, with the result that my suggested need of a geneological tree, seems warranted. When it is realized that in one case, I have an accurate record from the original parent stock to the third generation in direct line, with numerous uncles, aunts, cousins, brothers and sisters, it is apparent that the services of a trained genealogist may be needed to continue the record.

In trapping the occupants of my nest boxes, I have found it advisable to wait until the adults are actively engaged in bringing food to the young. There is then no question as to the mates for the nest under observation and there is less danger of the birds deserting. I have at times trapped one or both adults before the eggs were hatched or even laid, but they will almost invariably abandon the nest if interfered with at that time. I have also found it advisable to carry an account with the nest boxes since the resulting data provide interesting information relative to incubation periods and time from hatching to flight, as well as the choice of the birds for the different locations of the nest boxes.

In the paper previously referred to, I gave a summary of the first "wren divorce case" that came to my attention. In the following paragraphs this case is reviewed in addition to the family histories of four additional cases that I have studied. Although the term "divorce" may not be just the technical word that fits the case, their apparent love of change in marriage relations seems to fully justify its use. It has been suggested that poly-

¹ 'Bird-Banding by Means of Systematic Trapping' S Prentiss Baldwin, Abstract Proc. Linn. Soc. of N. Y., No. 31, 1919, p. 49.

gamy may enter into the consideration and that two families may be raised at once, but if this is ever true, there has been no evidence of it among the wrens that have been under my observation.

THE "A" GROUP.

My first case was provided by the pair of wrens that carried bands numbered 27739 and 27740 and reared their brood in box No. 9 on the greenhouse. These birds were banded on June 19, 1915 and after the young had flown I was absent from the farm for about six weeks. Upon my return on August 15, I was surprised to find another brood in this same box ready to fly. When the adults were trapped I was further surprised to find that while one parent was No. 27740, the other was unbanded. I gave this new mate band No. 27782 presuming at the time that No. 27739 had met with an accident.

But upon making the rounds of the other boxes I discovered that instead of being a casualty, this bird was the proud father (or mother) of another brood by another mate in a box only 100 feet distant on the pumphouse. I was unable to capture this mate but it was not a banded bird. Here was a clear case of divorce both birds remating with new mates and raising second broods the same season.

Number 27740 has not been heard from since, but the following year (June 23, 1916) No. 27739 was back in the box on the pumphouse where its second brood of 1915 had been raised. This year I succeeded in trapping the mate, banding it as No. 38491, but I do not, of course, know whether or not this was the second mate of 1915.

THE "B" GROUP.

On July 4, 1917, box No. 51, in the east garden was occupied by Nos. 44008, 44009 and their brood. Neither of these birds raised a second brood during that season (at least they did not occupy any of my boxes) but on June 19, 1918, No. 44008 was back at the same box, with a different mate No. 44100. The next year (June 17, 1919) box No. 19 on the greenhouse was occupied by these two, this being my first record of a pair of wrens that have either remained mated or have returned and remated after one season. This box is located about 200 feet from No. 51

where the 1917 and 1918 broods were raised. The broods of 1918 and 1919 were therefore full blood brothers and sisters although only step-brothers and sisters to the brood of 1917. No record of any of this family in 1920.

THE "C" GROUP.

Box No. 25 on the laundry was occupied June 17, 1919, by numbers 45302 and 45303. The brood was raised and No. 45302 then disappeared, but its mate, No. 45303, mated again and on July 10 was busily engaged in the rearing of a second brood in box No. 53, on the library, with a mate that was numbered 45349. For No. 45303 we thus have for this season a second mate and a second brood in a different box.

In 1920 (June 17) 45303 again returned and again started nest-building in box No. 25 on the laundry where the first brood of 1919 was raised. The mate this year was No. 45342, which had a curious history with 45335 and 45349 in 1919. He, 45342, had settled alone in box No. 53 on the library, on June 26, 1919, where he sang and carried on nest building by himself until driven out by 45349 and 45335. On July 29, 1920, this pair (45303 and 45342) were raising their second brood for the season, in the same box. The total record for No. 45303 is therefore; four broods in two years, or 27 young; with three mates. Three of the broods were raised in the same box. It should be further noted that in 1920 there was no divorce, as both broods were by the same mates, and in the same box.

Going back now to No. 45349, the second mate of 45303, and we have a little of his earlier history. He was taken on July 4, 1919 in box 53 on the library with 45335. These two were seen together just this one day but they seemed to be busily engaged in nest building. Number 45335 had been mated with No. 45334 in box 63 on the woodshed and their brood had only left the nest two days previous. This was apparently, only a flirtation however, as 45349 finally mated with 45303 (as above) in this box and raised a brood of seven youngsters.

In 1920, No. 45349, the second mate of 45303 in 1919, selected a new mate, No. 46006 and proceeded to nest in box No. 47 on the garage. Thus 45349 and 45303, who were mates for the second brood of 1919, both appear in 1920 with new mates.

THE "D" GROUP.

This family history started on July 14, 1918 when I banded numbers 45205 and 45206 at their nest in box No. 47 on the garage. The brood was not banded. Nothing more from this pair during 1918 and 45205 drops entirely from sight, but in 1919 (June 17) I found that 45206 had returned with a new mate, given band 45311, and was nesting in box No. 26 in the sugar house. After this brood had flown 45311 took a second partner No. 45324, and proceeded to nest in box No. 6 on the upper barn. This was on August 5, and as this second mate of 45311 was banded, I referred to my records to learn that it had already raised one brood that year (banded June 19) with No. 45332 in box No. 3 on the farmhouse.

This latter case (45324 and 45332) was the start of an interesting geneological tree. They were banded in box No. 3 on June 19, 1919, their brood receiving numbers 45325 to 45331. On June 22, 1920, I took and banded (No. 45968) a bird in box 53 on the library, where it had evidently been nest building alone, singing constantly. On July 5 a mate appeared which I captured on the 7th and my delight may be imagined when I found it was No. 45325, one of the 1919 brood of 45324 and 45332 raised in box No. 3 on the farmhouse.

These birds now moved around to the other side of the house to box No. 59, probably because I caught and handled them at No. 53 before the home ties were cemented by eggs and young. On July 27 their young were hatched and were later given bands No. 46074 to 46079. These young were therefore the grandchildren of numbers 45324 and 45332.

THE "E" GROUP

In the case of numbers 45334 and 45335, that started my record of the "E" family, there were strong indications of a serious flirtation as well as some unquestioned divorces. This pair nested in box No. 63 on the Woodshed and were banded together with their brood, on June 25, 1919. On July 4, just two days after their young had flown, No. 45335 was taken with No. 45349 in box No. 43 on the library (See "C" Family) where, after routing out No. 45342, who had been in solitary possession, they

engaged in active nest building for a day or two. The nest was then abandoned and it may be that 45335 returned to his former mate, No. 45334 in box No. 30 on the ice-house. This latter bird, with its mate, raised a second brood, the first having been in No. 63. I regret that I was unable to capture the mate, since if it was No. 45335, it would prove the suggestion of a flirtation.

Number 45335 returned in 1920 with a new mate, given number 45955, and a brood was raised in box No. 49 in the garden and banded on June 15. Following this they were divorced and with new mates they both proceeded to the raising of their second broods. Number 45335 mated with 45988 (new) and raised a second brood in box No. 63 on the woodshed, while No. 45955 mated with No. 46032 (also new) and nested in box No. 37 on the cottage. Thus after the divorce, both of the original pair secured new mates and raised second broods in the same season. Number 45335 has made a record of four broods in two seasons with at least three and possibly four mates, i. e. in case the first year's affair was only a flirtation. The second year it was a clear divorce.

It is interesting to note that in many cases, the second mates have been 'new' birds, i. e. they had not been recorded from my territory before, which would indicate that there must be considerable trading back and forth between different areas. In some other region, possibly close by my farm, there may have been several of my banded birds raising broods with mates that later moved over to my district and remated for the second brood. Such a theory could probably be proved if a well coordinated system were established. This might also explain what has become of the large number of young that I have banded, for, it will be seen from the foregoing account, only one of the young raised in my boxes has returned to nest in a succeeding season.

The successive matings of the birds in these five groups may be tabulated as follows in order to give a clearer idea of their complicated relationships. The first and second broods in each year are denoted by "a" and "b" after the year, while the "x" between two numbers indicates that the two birds represented by those numbers were paired. The device in Group "D" denotes that 45325 was the offspring of the 1919 pair with which it is connected.

GROUP A.

1915a. 27739 × 27740
 1915b. 00000 × 27739 27740 × 27782
 1916. 38491 × 27739

GROUP B.

1917. 44008 × 44009
 1918. 44100 × 44008
 1919. 44100 × 44008

GROUP C.

1919a. 45303 × 45302
 1919b. 45349* × 45303
 1920a. 46006 × 45349 45303 × 45342
 1920b. 45303 × 45342

GROUP D.

1918. 45205 × 45206
 1919a. 45206 × 45311 45324 × 45332
 1919b. 45311 × 45324 |
 1920. 45325 × 45968

GROUP E.

1919a. 45334 × 45335
 1919b. 45334 × 45335*(?)
 1920a. 45335 × 45955
 1920b. 45988 — × — 45335 45955 × 46032

In keeping an account with each nest box, I have also secured some interesting information relative to the incubation periods, length of time from hatching to flight, and various idiosyncrasies of these birds. For the sake of those who are interested in such data this is presented in the following table. I regret that it is not complete for all cases.

Box NUMBER	NEST STARTED	NEST COMPLETED	SET COMPLETED	EGGS HATCH	YOUNG LEAVE
6	—	—	July 4 (5)	July 13	July 28
23	July 4	No progress by July 23 and the nest removed.†			
25	July 4	July 6	July 13	July 26	Aug. 10
37	—	—	July 6 (6)	July 20	—
47	—	—	July 7	July 19	—
59	July 4	—	July 15 (6)	July 27	Aug. 12
63	—	—	—	July 3	July 20

* Just prior to pairing with 45303, 45349 was nest building for one day with 45335, but both abandoned the partnership. It is thought that the latter mated again with 45334 but this is not proven.

† This box is near No. 25 and the nest was apparently built by the occupants of No. 25 as a diversion, or in the same manner that marsh wrens build their dummy nests. The building instinct seems to need exercise in some cases, while the mate is incubating.

From the above data, I conclude that the incubation period is usually about 13 or 14 days and the period from hatching to leaving the nest, not less than two weeks, generally longer.

2930 Prospect Ave., Cleveland, Ohio.

THE ENGLISH SPARROW (*PASSER DOMESTICUS*) AND THE MOTOR VEHICLE.

BY W. H. BERGTOLD.

The writer does not hesitate to express and record his conviction that there has been a very notable decrease in the number of English Sparrows in Denver, during the past few years; this decrease amounts, almost, to disappearance within the business area. It is now, unfortunately, impossible to fix the exact beginning of this decrease, but the writer feels safe in saying that it has been going on for at least three or four years.

It will be of interest, and of some importance to analyze the conditions which, probably, have been, and are, bringing about a much-to-be desired diminution in the numbers of this exotic bird.

Fifteen years ago one could see on any of the crowded business streets of Denver, dozens, nay, hundreds of English Sparrows, and the air was then resonant with their shrill notes of love, war and alarm; during the past few months the writer has taken special notice of the abundance of this sparrow in the down-town districts, often making special excursions through various streets for the express purpose of estimating such abundance. It is the plain truth when the statement is made that not even a single sparrow has been seen on the business streets during any of the walks; the writer frequently walks from his office to various places of business, a mile or more, and does not *hear* any English Sparrows, much less see them. If this change be pointed out to the average citizen, he suddenly awakens to its truth and asks "why?"

There is a well grassed and timbered area surrounding the Court House opposite the writer's office and fifteen years ago both its trees and lawn were simply alive with English Sparrows, and their dis-

cordant cries made a din too well known to need describing anew. The trees also served as night roosting places for these sparrow hordes, a fact plainly evidenced by the filthy and heavily chalked condition of the underlying sidewalks. It seems to the writer that a conservative estimate of the sparrow population of this area as the conditions were at the time, could not have been less than one thousand birds; a recent careful daily examination of this locality, especially during the past few weeks reveals a remarkable, and at the same time, a most gratifying change.

The following quotations from the writer's notes are far more impressive than any detailed description would be, which he might attempt to write.

"Oct. 10., 1919—11.30 A. M., Bright warm day—Saw five sparrows only, about Court House, and heard five others. There are only two or three small chalked areas on the sidewalks.

Oct. 11, 1919—Warm clear day; saw six sparrows on Court House premises, all were eating of the seeds of "wire grass" growing in the lawn; heard three others in the trees and saw two on adjacent buildings.

Oct. 13, 1919—Bright warm day, 10 A. M., nineteen sparrows seen on or about Court House but some of these may have been "repeats."

Oct. 15, 1919, 4.30 P. M.—Cold and cloudy. Saw two sparrows, and heard three others about Court House. House Finches singing merrily.

Oct. 21, 1919, 11.30 A. M.—Cold and cloudy; three sparrows seen on Court House grounds.

Oct. 22, 1919, 10 A. M.—Mild and clear; nine sparrows seen and five heard about Court House square.

Oct. 24, 1919, 9.30 A. M.—Cold and misty—Saw ten and heard two sparrows about Court House.

These notes show that there has been a remarkable diminution in the numbers of English Sparrows about this locality, and the same condition of decrease can be said to obtain in the residential districts but to a lesser degree.

It has been shown (Auk Vol. XXX p. 70) that the English Sparrow was responsible for the destruction of 16% of the nestling House Finches hatched in nesting boxes provided for that purpose by the writer; during the past three years the writer's boxes for nesting finches have been disturbed very little by English Sparrows, only one of a considerable number of broods having been destroyed by this sparrow. In previous years the writer spent a good deal of his spare time, when at home, in protecting his House

Finches from the ravages of the English Sparrow, but it has not been at all necessary during the past three years. This relief from sparrow depredations, it would seem, has not been due to increased protection, but rather to the absence of sparrows; the fact is there have been fewer sparrows to harass the finches. It was the small loss of nests, eggs and nestling House Finches, through sparrow depredations, which focused the writer's attention on the decrease of this species, and lead him to make extended observations on pertinent conditions and facts.

The writer does not wish to be understood as stating that the English Sparrow pest had ceased in Denver; far from it, but that there is a marked decrease seems beyond cavil and that this decrease is still going on, probably at an accelerating pace, is almost a demonstrated fact to the writer.

To what can this changed condition be attributed? Increase of enemies, mortality by disease, changing environment, or lessening of food supply, all of these, and perhaps more, might be cited as possible causes. So far as the writer can determine (or learn) there has been no increase of any natural enemy of this sparrow, nor are there any indications of a wide spread decimating disease infecting and killing off this species; there is also little or no appreciable change in the sparrow's local environment, for there has been very little disturbance of shade trees, or loss of lawn areas in the areas wherein there has been the most noticeable diminution of sparrow numbers, and there are as many, or more, favorable nesting sites as ever. There has been, however, an enormous loss of food, a factor admittedly repressing a given species as much, if not more, than any other single condition. The loss of food comes about through an unexpected reaction following the appearance of new manifestations of civilization.

With this in view a glance at the horse population of the city of Denver is at once interesting and illuminating—the officials of the Denver Union Water Co., kindly supplied the writer with data which gave an approximate idea of the number of horses in Denver during several different past years. From these data we find that the number of horses in Denver in 1897 was 2601, in 1907, 5904, and in 1917, 3832. There were probably quite a good many in excess of these figures each year, but the figures

just given show the minimum number of horses that were supplied with water by the Water Company. These data show that there was a decrease of 33% in the number of horses in Denver between 1907 and 1917, notwithstanding that the human population had grown steadily and that the number of houses had multiplied extensively. This steady increase of human population, and the increase of houses obviously made for more garbage, etc., which however is only sparingly utilized by the English Sparrow, if it can get grain, etc. It is, however, not on this source of food that this species lives in the urban districts. The writer is thoroughly convinced that this species lives, especially in the downtown districts, almost exclusively on horse manure. To test the above mentioned data on horses, a rough check on the equine population in Denver was undertaken last summer, through the making of a count of the horses seen on the streets, while the writer drove about in various parts of the city. Inasmuch as most of such driving is done in the residential portions of the city, many drives were directed through the business sections, particularly in the wholesale districts, where the harnessed horse is still much in evidence.

It is highly probable that data gathered in this way include many "repeats," an error which would, in effect, strengthen conclusions as to a diminishing horse population. The highest number of harnessed horses seen on any single day on the streets of Denver was 140, and the lowest was 11 (no counts having been made on Sundays or holidays), the average of fifteen days in July having been 70. While the writer has no earlier collected data to submit in parallel with these just given it seems self-evident that this average of 70 horses per day is a striking decrease from the average which probably obtained five years ago. Unless the writer's recollections are unreliable and hazy, it would seem to him that ten years ago two or three times that number of horses would have come under observation during the same period of time. There can be, however, little question concerning the reality of the "vanishing horse," for it has been shown (Saturday Evening Post, Sept. 13, 1919) that the number of horses in New York City recently declined from 108,036 to 75,740, and it is probable that what amounts to decrease (by displacement or

substitution) has occurred also in suburban areas, since statistics seem to show a decrease or displacement of 33% of the horses in one of the Dakotas. Finally in this connection it can be said that early in November 1919 there were enough tractors in use in Colorado to displace 16,000 horses, which shows that conditions reported in New York City and in Dakota also obtain in the state of Colorado.

One can ascertain approximately how much difference the smaller horse population has made in the amount of refuse removed from the streets of Denver, through the Street Cleaning Department records. Officials of this Department have kindly furnished some interesting facts shedding light on this question of street sweepings, etc.

A record of the cubic yards of street sweepings, and the number of blocks whence such sweepings are derived, is kept by this Department of civic activities; before and up to 1911 only the undivided total sweeping yardage was recorded, but in recent years the yardage gathered by the sweeping machines, and by the "push cart brigade" has been differentiated and separately recorded. A tabulation of the machine sweepings shows that in 1911, 38,000 cubic yards, in 1914, 30,000 cubic yards, and in 1919, 13,000 cubic yards were collected, the figures for 1914 and 1919 being estimated for the whole year from the September sweepings of the respective years, September having been chosen because it is one of the driest months, and hence there is then little or no natural cleaning of the streets by rain. These data, just given, are based on the assumption that the surface blockage remained stationary from 1911 to 1919, which is far from being the case. Notwithstanding a definite increase of surface to be cleaned each year, the yardage of sweepings steadily diminished in place of increasing as it would have done, all other things having been equal. In terms of cubic yards per block the machine sweepings are as follows: 1911—0.38 cubic yards, in 1914—0.31 cubic yards, and in 1919—0.13 cubic yards. It needs no great effort of the imagination to picture to oneself, the vast difference this steady and great decrease of surface refuse has made in the food supply of the English Sparrow. The push cart sweepings were and are practically all horse droppings, and were and are

gathered almost entirely in the business districts. Of the combined yardage of machine and push cart sweepings in 1914 and 1919, about 30% is charged against the push carts. Assuming this ratio to have held true in 1911 (in truth probably a low estimate), calculating the push cart sweepings for 1911 from its total sweepings by this ratio, and tabulating all three years, it appears that in 1911 there were 1.61 cubic yards, push cart sweepings per block, in 1914 there were 0.96 cubic yards per block, and in 1919 there were 0.71 cubic yards per block. These data mean that there was a diminution of 56% in the amount of horse droppings from 1911 to 1919. Expressed in actual cubic yardage of sweepings, they mean that from the same number of blocks swept by push cart men in 1911, 1260 cubic yards, in 1914, 1003 cubic yards and in 1919, only 474 cubic yards were gathered, all of which indicates that nearly 786 cubic yards of clear horse manure have thereby been gradually substracted from the daily, food supply of the English Sparrows inhabiting those areas. These data are more or less official and are at least approximately correct and accurate, and illustrate in a convincing manner, the truth of the belief that there has been wrought a great change in the urban sparrow's food supply during the past ten years. It would thus appear that there is ample cause alone, in the great diminution of the food supply, to explain the notable decrease of English Sparrows in Denver.

Obviously there is but one cause to which one can attribute the great shrinkage in the equine population of this city, namely the displacement of the harnessed horse by the motor vehicle; it is something unexpected to realize that an advance of civilization can bring about a beneficial change in the biology of a large city. While it has been almost unnoticed, it has been none the less certain and effective; the self-propelled vehicles of a city affect the sparrow not only through starvation, but probably also through making the species's street life so hazardous and fatal as to drive it largely out of the business areas.

It would be of interest to know if like conditions prevail in other large cities of this country.

Since this was written, November, 1919, there appears, to the writer, to have been a steady diminution of English Sparrows in

Denver, though at a slackened rate. The horse population of Denver as last reported, February, 1921, was 347, and that the displacement of horses in this and other urban areas is still going on, probably at an accelerated rate, seems indisputable. It was reported in March, 1921, in the public press, that motor trucks had increased in New York City to 68,000, an increase bringing about an actual, and a potential, displacement of hundreds, if not thousands, of horses; in fact the ton capacity of these 68,000 trucks, it is said, would employ 1,260,000 horses. The facts herein reported seem of especial importance to our western states, notably California, and it appears to the writer that in these states persistent and thorough attention to suppressing or removing adventitious food supplies of the English Sparrow will give gratifying results in preventing the establishment, and the spread and increase of this pest.

Conclusions:

- 1—That there are fewer English sparrows in Denver than ten years ago.
- 2—That there has been a notable decrease in the horse population of Denver during the past five years.
- 3—That there has been a very patent diminution in the amount of sweepings gathered from the streets of Denver during the past decade.
- 4—That the reduction in street sweepings has resulted in diminishing Denver's English Sparrow population by starvation.
- 5—That all of the above results hinge on the introduction, and multiplied uses, of the motor vehicle.

1159 Race St., Denver, Colo.

A LIST OF THE BIRDS OF ROYAL PALM HAMMOCK, FLORIDA.

BY ARTHUR H. HOWELL.

Royal Palm Hammock—known also as Paradise Key—is an island or 'Key' situated on the eastern edge of the Everglades in southern Dade County, about 11 miles southwest of Homestead.

This hammock, containing about 400 acres, largely covered with a dense tropical jungle, together with a considerable tract of the surrounding Everglades, has been set aside recently as a reservation under the name of the "Royal Palm State Park," and given into the custody of the Florida Federation of Women's Clubs.¹ The Federation has built a roomy and comfortable lodge in the Hammock and a warden is stationed there. A good rock road leads to the Hammock and in a short time is expected to be continued to Cape Sable. Numerous trails have been cut through the jungle and many of the more interesting trees have been provided with labels giving their common and scientific names. It is now easily possible, therefore, for anyone to visit this unique and attractive spot and to study under especially favorable conditions its fauna and flora.

The Hammock has received considerable attention from botanists, particularly Dr. John K. Small, who has made many trips to the region and has published an extended description of its history and principal botanical features.² More recently Mr. W. E. Safford, of the U. S. Department of Agriculture, has published an interesting account of the natural history of the Hammock, in which four pages are devoted to a cursory account of some of the birds occurring in the region.³

According to Dr. Small 162 native species of flowering plant and 13 species of ferns are known from the Hammock. The list of trees numbers 46 species. The flora is almost wholly tropical in its affinities, most of the trees and shrubs being unknown in the United States outside of the Florida Keys and the Everglade Keys. The most striking feature of the Hammock vegetation—that which makes it unique—is the presence of upwards of a hundred tall and graceful royal palms (*Roystonea regia*) which tower far above the rest of the forest, reaching, it is said, 100 to 120 feet in height.

¹ For a full account of the history of the Park consult an article by Mrs. W. S. Jennings, in *The Tropic Magazine*, Vol. IV, No 1, April, 1916.

² Small, John K., *Journ. New York Bot. Garden*, Vol. 17, Oct., 1916, pp. 165-172.

³ Safford, W. E., *Natural History of Paradise Key and the Nearby Everglades of Florida*: Smithsonian Rept. for 1917 (1919), pp. 419-423.

Considering the richness of the flora in the subtropical jungle of the Hammock, the bird fauna is surprisingly meagre. Of the breeding species, only three can be said to be abundant, these being the Florida Cardinal, the Florida Wren, and the Key West Vireo. Occurring less commonly in the forest are the Chuck-will's-widow, Yellow-billed Cuckoo, Summer Tanager, Florida Crow, and Southern Pileated Woodpecker. It will be seen from this list that in spite of the distinctly Tropical character of the flora no birds of Tropical affinities are found in the Hammock.

In the pine lands on Long Pine Key and on the mainland east of the Hammock, Pine Warblers, Red-bellied and Red-cockaded Woodpeckers, Crested Flycatchers, and Bluebirds are the most numerous resident species.

In winter, also, the bird life of the Hammock is not nearly so abundant as in northern Florida, but in the migrations this region is visited by a considerable number of species, some of which at certain times occur abundantly.

The land birds of southern Florida have received comparatively little attention from naturalists. The southern limits of both the breeding and winter ranges of even the commonest species are not well known, almost nothing has been recorded concerning their migrations, and very few specimens have been collected.

The present list, therefore, while of a preliminary nature and doubtless far from complete, is presented as a résumé of our present knowledge and a basis for future investigations. Royal Palm Hammock apparently serves as a convenient way station at irregular intervals for a considerable number of migratory species on their journeys to and from the West Indies or South America, and continuous observation covering a period of years will be necessary before even a measurably complete list of the birds can be prepared. It is hoped that the warden of the Park will be encouraged to keep as full notes as possible of the birds visiting the Hammock and in the case of certain rare or obscurely marked species, he be permitted to collect specimens to verify his observations.

The list presented herewith gives the results of two collecting trips to the Hammock by the writer, in the interests of the U. S. Biological Survey, covering the periods from January 15-Febru-

ary 5 and June 11-19, 1918, together with notes made on numerous trips to the Park by Mrs. Hiram Byrd, and the observations of the Park Warden, Mr. Charles A. Mosier. Notes made in the Park by Dr. Henry C. Burgess, of Canandaigua, N. Y., December 26-28, 1917, and by Dr. Alexander Wetmore, February 20-28, 1919, are also included. My thanks are gratefully extended to the persons mentioned for their valued assistance.

I am likewise greatly indebted to the officers of the Florida Federation of Women's Clubs for permission to collect a limited number of specimens in the Park and for other courtesies freely extended.

***Podilymbus podiceps*.** PIED-BILLED GREBE.—Winter resident; not common; seen frequently in Taylor River slough in December and January.

***Anhinga anhinga*.** WATER TURKEY; "SNAKE-BIRD."—Common winter resident; less numerous in summer; seen in Taylor River slough, October 12, 1917 (Mrs. Byrd), December 27, 1917 (H. C. Burgess), January, 1918, and June 12, 1918.

***Phalacrocorax auritus floridanus*.** FLORIDA CORMORANT.—Rare winter visitant; one specimen taken, January 21, 1918, as it flew over Taylor River slough.

***Pelecanus occidentalis occidentalis*.** BROWN PELICAN.—A lone Pelican appeared on January 26, 1918, in a ditch along the road crossing the glade to the eastward of the Hammock; it was very tame, remaining unalarmed as automobiles passed within a few feet; the bird remained in the vicinity during most of two days.

***Fregata magnificens rothschildi*.**¹ MAN-O-WAR BIRD.—Irregular visitor; Mr. Mosier has frequently seen single individuals soaring over the Hammock.

***Anas platyrhynchos*.** MALLARD.—Rare migrant; Mosier reports a pair or two seen nearly every spring and fall.

***Anas fulvigula fulvigula*.** FLORIDA DUCK.—Occasional, both in winter and summer; may breed. Noted by Mrs. Byrd, November 11 and December 24, 1917; a pair seen, June 12, 1918, by D. J. Nicholson, flying up Taylor River slough; small flock seen June 18, 1918, by workmen in the canal south of the Hammock.

***Querquedula discors*.** BLUE-WINGED TEAL. Reported by Dr. H. C. Burgess, December 26-28, 1917.

***Aristonetta valisineria*.**² CANVASBACK.—Mr. Mosier reports a pair seen about the last of December, 1917, in the glade east of the Hammock.

***Guara alba*.** WHITE IBIS.—Common winter resident; less numerous in summer. Seen by Mrs. Byrd on October 12, November 4, December

¹ *Fregata aquila* of the A. O. U. Check-List.

² *Marila valisineria* of the A. O. U. Check-List.

23, 1917; flock of about 100 seen by the writer, January 15, 1918 and smaller flocks January 24 and June 12, 1918; Wetmore saw about a dozen, February 21-27, 1919.

***Mycteria americana*.** WOOD IBIS.—Occasional winter visitant; single birds seen January 26, 28, and February 3; bunch of three on January 29, 1918; one seen by Wetmore, February 22, 1919.

***Botaurus lentiginosus*.** AMERICAN BITTERN.—Regular winter resident in sloughs and ponds; noted by Mrs. Byrd, March 4, October 13, December 23, 1917; one or two seen almost daily from January 15 to February 4, 1918. Mr. Mosier found a nest of the Bittern in the Park in 1917; the bird was seen on the nest at close range.

***Ardea occidentalis*.** GREAT WHITE HERON.—Rare or casual resident; a pair nested in March, 1916, in a pond apple tree near the head of Taylor River slough; one young was raised and the family remained in the vicinity till the summer of 1917. One adult individual was observed in the slough, January 15-18, 1918.

***Ardea herodias wardi*.** WARD'S HERON.—Resident in moderate numbers; seen occasionally in the sloughs and prairie glades in January, February, and June.

***Hydranassa tricolor ruficollis*.** LOUISIANA HERON.—Common winter visitant; seen by Burgess, December 26-28, 1917; and by Wetmore, February 20-28, 1919; numerous on the glades and along ditches, January 15-26, 1918 after which date they disappeared.

***Florida caerules caerules*.** LITTLE BLUE HERON.—Common winter visitant; rare summer visitant; seen by Burgess, December 26-28, 1917; numerous on the glades and along ditches, January 15-26, 1918, associating with Louisiana Herons. Flock of 8 seen, June 12, 1918.

***Butorides virescens virescens*.** GREEN HERON.—Moderately numerous, both in winter and summer; several noted daily, January 15-February 5, in Taylor River slough; about two pairs in same locality, June 12, 1918.

***Nycticorax nycticorax naevius*.** BLACK-CROWNED NIGHT HERON.—Common winter resident; seen by Burgess, December 26-28, 1917; 15-20 living in Taylor River slough, January 15-February 5, 1918.

***Nyctanassa violacea*.** YELLOW-CROWNED NIGHT HERON.—Winter visitant, not common; probably breeds; one adult taken January 15, 1918; three immature individuals seen June 14, 1918; two seen by Wetmore, February 23, 1919.

***Grus canadensis mexicana*.** SANDHILL CRANE.—Rare; a pair of these birds were seen by Mosier every day during the first half of June, 1918, flying to the slough from the sawgrass glades south of the Park, where probably they were nesting; a pair seen also, by Wetmore, February 27, 1919.

***Aramus vociferus*.** LIMPKIN.—Rare summer resident; a pair living on the glade just east of the Hammock, June 12-16, 1918, probably bred there; Wetmore observed three individuals in the same locality, February 20-27, 1919, feeding on marsh snails (*Ampullaria depressa*).

***Rallus elegans*.** KING RAIL.—Rare resident, probably breeds; seen by Mrs. Byrd, October 12 and 20, and December 24, 1917; several observed in Taylor River slough, January 15 and 21, 1918, and one on the marshy glade adjoining the slough, June 12, 1918.

***Porzana carolina*.** SORA, OR CAROLINA RAIL.—Winter visitant; two specimens caught, January 19, 1918, in rat traps set on the marshy glades.

***Ionornis martinicus*.** PURPLE GALLINULE.—Uncommon winter visitant; single birds seen, January 7, 1917 (Mrs. Byrd), December 27, 1917 (Burgess), January 15 and 20, 1918.

***Gallinula chloropus cachinnans*.**¹ FLORIDA GALLINULE.—Common winter resident; noted by Mrs. Byrd, October 13, and November 11, 1917; numerous in Taylor River slough, January 15–February 5, 1918.

***Fulica americana*.** COOT.—Uncommon winter resident; noted by Mrs. Byrd, January 17 and November 11, 1917; three or four in the slough January 15–26, 1918.

***Gallinago delicata*.** WILSON'S SNIFE.—Two individuals observed by Mosier, December 24, 1917.

***Totanus melanoleucus*.** GREATER YELLOWLEGS.—Rare winter visitant; seen by Mrs. Byrd, December 24, and by Dr. Burgess, December 27, 1907; one specimen collected, January 15, 1918.

***Totanus flavipes*.** YELLOWLEGS.—Flock of 7 observed by Mrs. Byrd, December 24, 1917; seen also by Dr. Burgess, December 26–28, 1917.

***Catoptrophorus semipalmatus*.** WILLET.—Occasional visitant; single individuals observed by Mrs. Byrd, December 24, 1917 and January 4, 1918 on the glade east of the Hammock.

***Oxyechus vociferus vociferus*.** KILLDEER.—Common winter resident on the Everglade prairies; noted on various dates between November 11 and February 5.

***Colinus virginianus floridanus*.** FLORIDA BOB-WHITE.—Rare resident; a pair were living on the borders of Long Pine Key, on the edge of the glades, in June, 1918, probably breeding there. Mr. Mosier has seen two quail in the Hammock proper.

***Meleagris gallopavo osceola*.** FLORIDA TURKEY.—Very rare resident; one seen in the Hammock by Mosier on January 14, 1918.

***Zenaidura macroura carolinensis*.** MOURNING DOVE.—Rare resident; a few seen in December, 1917 (Burgess) and January, 1918.

***Chaemepelia passerina passerina*.** GROUND DOVE.—Uncommon resident; reported by Burgess, December 26–28, 1917; three or four seen in the road through the Hammock in January, 1918 and three around a mule pen on the rock road across the Everglades south of the Park, June 17, 1918.

***Cathartes aura septentrionalis*.** TURKEY VULTURE.—Common resident, less numerous in summer.

¹ *G. galeata* of the A. O. U. Check-List.

Coragyps urubu. BLACK VULTURE.—Uncommon; six seen over the glades, January 24, 1918; seen by Mrs. Byrd, December 24, and by Dr. Burgess, December 26–28, 1917.

Elanoides forficatus forficatus. SWALLOW-TAILED KITE.—Uncommon summer resident; Mrs. Byrd saw one, May 21, 1915; a single specimen was collected in the pineland just east of the Hammock, June 13, 1918 and two days later, four birds were seen at once sailing over the glades.

Rostrhamus sociabilis. EVERGLADE KITE.—Rare summer resident; one seen by Mrs. Byrd, May 21, 1915. A pair—the first of the season—seen over the glades on January 26 and 27, 1918, but not again during my stay; on June 19, 1918, as I drove out from the Hammock in an automobile, we passed within a few feet of an Everglade Kite sitting on a bush close to the road across the glade. The species was several times observed by Mr. Mosier in October, 1918.

Circus cyaneus hudsonius.¹ MARSH HAWK.—Uncommon winter visitant; single individuals noted January 7, 1917 (Mrs. Byrd); December 27, 1917 (Burgess); January 18, 20, and 30, 1918; and February 23, 1919 (Wetmore).

Accipiter velox. SHARP-SHINNED HAWK.—Uncommon winter visitant; single individuals seen, January 15 and 18, 1918.

Buteo borealis (subsp.?). RED-TAILED HAWK.—Uncommon resident; small numbers seen, January 26 and 30, 1918.

Buteo lineatus alleni. FLORIDA RED-SHOULDERED HAWK.—Common resident; found both on Royal Palm Hammock and on the smaller hammocks which dot the everglades; several specimens taken.

Buteo platypterus platypterus. BROAD-WINGED HAWK.—One specimen taken, January 19, 1918, along the road through the Hammock.

Haliaeetus leucocephalus leucocephalus. BALD EAGLE.—Rare resident; single birds seen by Mrs. Byrd, January 7, 1917 and by Mr. Mosier, January 13, 1918.

Cerchneis sparveria paula.² LITTLE SPARROW HAWK.—Not uncommon in pineland and between Florida City and the Hammock; has been seen in the Hammock by Mosier.

Pandion haliaetus carolinensis. OSPREY.—Occasional visitant; two seen by Mrs. Byrd, January 4, one by the writer, January 20, and several by Mr. Mosier, October 17, 1918.

Tyto alba pratincola.³ BARN OWL.—“White” owls are frequently seen in the Hammock by the warden; a feather picked up in the jungle was identified as belonging to this species. In December, 1919, Mr. Mosier picked up a pellet which the owl dropped as he flew from his perch; this was examined in the Biological Survey and found to contain the remains of a cotton rat *Sigmodon hispidus*.

¹ *C. hudsonius* of the A. O. U. Check-List.

² *Falco* of the A. O. U. Check-List.

³ *Tyto pratincola* of the A. O. U. Check-List.

***Strix varia alleni*.** FLORIDA BARRED OWL.—Common resident on Royal Palm and other smaller hammocks in the Everglades; one specimen taken, January 23, 1918.

***Otus asio asio*.**¹ FLORIDA SCREECH OWL.—Fairly common resident; one heard calling nearly every evening near the Lodge.

***Coccyzus americanus americanus*.** YELLOW-BILLED CUCKOO.—Fairly common summer resident; rare winter resident; single individuals noted by Mrs. Byrd, January 7 and December 24, 1917; numerous, June 12–19, 1918 (one specimen taken).

***Streptoceryle alcyon alcyon*.** BELTED KINGFISHER.—Common winter resident on the glades and about ditches in the pineland.

***Campephilus principalis*.** IVORY-BILLED WOODPECKER.—Very rare resident; in May, 1917, Mr. Mosier found a nest of this species in a dead royal palm stub, about 35 feet from the ground; he had a perfectly clear view of the old birds and of three young sticking their heads out of the hole. He has on a few occasions since then seen or heard this bird, but no indications of breeding were discovered in 1918 or 1919; it was last seen in February, 1919.

***Dryobates villosus auduboni*.** SOUTHERN HAIRY WOODPECKER.—Rare resident; reported by Dr. Burgess, December 26–28, 1917; one seen, January 30, 1918, in pineland east of the Park; one heard calling in the Hammock, June 12, 1918.

***Dryobates pubescens pubescens*.** SOUTHERN DOWNY WOODPECKER.—Uncommon; two seen near the Park lodge, June 12, 1918.

***Phrenopicus borealis*.** RED-CKADED WOODPECKER. Common resident in pineland between Florida City and the Hammock and on Long Pine Key on the Everglades; Mosier has seen the species in Royal Palm Hammock.

***Sphyrapicus varius varius*.** YELLOW-BELLIED SAPSUCKER.—Rare winter visitant; single individuals seen by Mrs. Byrd, March 11 and November 11, 1917, and by Dr. Burgess, December 26–28, 1917.

***Phloeotomus pileatus pileatus*.** PILEATED WOODPECKER. Uncommon resident in the dense jungle of the Hammock, nesting in royal palms; they are frequently heard, but rarely seen.

***Centurus carolinus*.** RED-BELLIED WOODPECKER.—Common resident, both in the Hammock and in pineland hammocks on Long Pine Key and on the mainland eastward of Royal Palm.

***Colaptes auratus auratus*.** FLICKER.—Occurs in small numbers, at all seasons; a few pairs breed in the Hammock and on Long Pine Key; seen by Mrs. Byrd, October 13, 20, and 27, 1917; and by the writer, January 21–28 and June 12–18, 1918.

***Antrostomus carolinensis*.** CHUCK-WILL'S-WIDOW.—Uncommon summer resident; several were heard singing every evening near the Park lodge, June 12–18, 1918.

¹ *O. A. floridanus* of the A. O. U. Check-List.

² *Ceryle* of the A. O. U. Check-List.

³ *Dryobates* of the A. O. U. Check-List.

***Setochalchis vocifera vocifera*.** WHIP-POOR-WILL.—Moderately common winter resident; January 15, 1918, I saw two feeding at dusk over the glade east of the Hammock and the next evening shot a specimen in the road; January 24, in the forenoon I saw one in open, rocky pine woods on Long Pine Key, flushing it several times at close range, and the same evening saw two more in the road in Royal Palm Hammock; January 28, about daybreak, I heard one singing a few times. Wetmore observed the Whip-poor-will and heard it singing, February 20–26, 1919.

***Chordeiles minor chapmani*.** FLORIDA NIGHTHAWK.—Moderately common migrant and summer resident; seen by Mrs. Byrd, October 12 and 20 and November 4, 1917; two or three seen every evening, June 12–18, 1918, hawking about the clearing around the Park lodge and others seen frequently over the glades in full daylight.

***Archilochus colubris*.** RUBY-THROATED HUMMINGBIRD.—Rare winter resident; two seen, January 24, 1918.

***Tyrannus tyrannus*.** KINGBIRD.—Common summer resident; June 12, 1918, a pair of Kingbirds were found nesting in a small pond-apple tree on the edge of a slough on the glades north of the Hammock; the nest, which was over the water, contained 4 young birds. Kingbirds were numerous, June 14, in pineland about a mile east of the Hammock, and several were seen, June 17, on Long Pine Key.

***Tyrannus dominicensis*.** GRAY KINGBIRD.—Observed by Dr. Burgess, December 26–28, 1917; this is a common species in summer along the coast, but is rarely seen far from salt water.

***Myiarchus crinitus*.** CRESTED FLYCATCHER.—Moderately common resident; several were heard or seen daily in the Hammock jungle, January 15–February 5, 1918; a pair bred near the Lodge in June and several specimens were collected in a little hammock on Long Pine Key, June 17, 1918; seen also in open pineland east of Royal Palm Hammock.

***Sayornis phoebe*.** PHOEBE.—Common winter resident; seen daily in small numbers during my January visit, chiefly on the prairie glades and around sloughs or ditches; they perch on low bushes over or near the water and make sallies for their food out over the water.

***Myiochanes virens*.** WOOD PEWEE.—Uncommon transient; observed in fall or winter by Mrs. Byrd.

***Cyanocitta cristata cristata*.** FLORIDA BLUE JAY.—Uncommon resident; seen in small numbers, January 15–February 5, 1918, in the Hammock and nearby pinelands; one or two heard calling in the Hammock in June.

***Corvus brachyrhynchos pascuus*.** FLORIDA CROW.—Common resident, less numerous in summer than in winter. In January, 1918, Crows were numerous in the Hammock and on the surrounding glades, often as many as 20 being seen in a flock. They are very tame and several individuals come regularly to a platform close to the lodge to feed on table

¹ *Antrostomus* of the A. O. U. Check-List.

scraps put out for them. One individual with a very high-pitched voice has been noted by Mr. Mosier from time to time for over a year. Only about two pairs bred in the Hammock in 1918; in June, one pair were feeding large young in a nest in the woods close to the lodge.

Corvus ossifragus. FISH CROW.—Rather uncommon and irregular in their appearance; one specimen was collected, January 29, 1918, from a flock of 8 which had alighted in trees near the rock pit; three were seen, February 3, feeding along a ditch on the Everglades, and three in nearly the same place on June 18, 1918.

Agelaius phoeniceus phoeniceus.¹ FLORIDA RED-WING.—Common summer resident; less numerous in winter. A few small flocks and single birds were seen, January 15–25, 1918, on the prairie glades; June 12, several nests containing young and others containing eggs were found in sawgrass and small bushes on the glades.

Sturnella magna argutula. SOUTHERN MEADOWLARK.—Common resident; in January, 1918, small numbers were noted on the prairie glades west of the Hammock, and in June the birds were abundant in the same locality, flying about with large young.

Icterus spurius. ORCHARD ORIOLE.—One was noted, October 13, 1917, by Mrs. Byrd.

Euphagus carolinus. RUSTY BLACKBIRD.—Irregular migrant; about 20 were noted by Mrs. Byrd, October 20, 1917; others January 7 and November 4, 1917.

Quiscalus quiscula quiscula.² FLORIDA GRACKLE.—Uncommon winter resident; apparently does not breed in the vicinity of the Hammock, though breeding commonly near Florida City. Single birds were seen, January 19, 26, and 30 and a flock of 30 on February 3, flying to a roost to the southward of the Park.

Megaquiscalus major major. BOAT-TAILED GRACKLE.—Common at all seasons on the wet everglades around the Hammock, breeding in tall reeds in the sloughs. Nearly full-grown young were flying with the adults by the middle of June, and all seemed to be going at night to a common roost south of the Park.

Passerculus sandwichensis savanna. SAVANNAH SPARROW.—Fairly common winter resident; seen in small numbers on the everglade prairie west of the Hammock, January 19–28, 1918; the birds were living around seed beds and apparently caused some damage by nipping off young tomato plants. Six birds of this species were noted by Mrs. Byrd, December 24, 1917.

Ammodramus savannarum (australis?). GRASSHOPPER SPARROW. Rare winter resident; observed by Mrs. Byrd, December 24, 1917 (4 individuals), and January 4, 1918; one specimen taken (but not saved) January 25, on Long Pine Key.

¹ *A. p. floridanus* of the A. O. U. Check-List.

² *Q. q. aglaeus* of the A. O. U. Check-List.

Zonotrichia albicollis. WHITE-THROATED SPARROW.—Rare winter resident; six observed by Mrs. Byrd, November 4, 1917; seen also by Dr. Burgess, December 26–28, 1917; I saw none in January.

Melospiza melodia melodia. SONG SPARROW.—Rare winter resident; small numbers seen by Mrs. Byrd, November 11 and December 24, 1917 and January 3, 1918.

Melospiza georgiana. SWAMP SPARROW.—Rare winter resident; seen by Mrs. Byrd, December 24, 1917, and January 4, 1918, and by Dr. Wetmore, February 22, 27, and 28, 1919; I observed a few in thick brush or sawgrass, January 15, 20, 24, and 30, 1918.

Pipilo erythrophthalmus alleni. WHITE-EYED TOWHEE.—Rare winter resident; none seen in summer. One or two birds were living in thick scrub on the edge of the heavy jungle, January 15–February 5, 1918; their notes were heard nearly every morning, but the bird was so shy that it was seen only once.

Cardinalis cardinalis floridanus. FLORIDA CARDINAL.—Abundant resident, though less conspicuous in winter by reason of not being in song. In summer, this is probably the most abundant bird in the Hammock. Heard singing at all hours of the day, from daybreak to sundown.

Zamelodia ludoviciana. ROSE-BREASTED GROSBEAK.—Rare migrant; one noted by Mrs. Byrd, December 24, 1917.

Passerina ciris. PAINTED BUNTING.—Rare winter resident; single individuals observed by Mrs. Byrd, March 11, 1917 and by the writer, January 25 and February 4, 1918.

Piranga rubra rubra. SUMMER TANAGER.—Rare summer resident; only one male was seen in the Hammock in June, singing every day from tall live oaks near the Lodge. One or two were noted in pineland east of the Hammock.

Progne subis subis. PURPLE MARTIN.—Abundant migrant; Mrs. Byrd describes a very large flight of Martins in November, 1917, as follows:

"At 4 p. m., November 4, the Martins were observed circling over a glade at edge of Park, and as far as we could see. Starting home (toward Homestead) they did not diminish in numbers until we had gone nine miles. We roughly estimated ten to the acre. In places the air was thickly peppered with them. There might have been anywhere from a hundred thousand to a million or more. Again late in the afternoon of November 11th, we saw great flocks of swallows over the glades. Some were Martins, some Cliff Swallows."

Petrochelidon albifrons albifrons.¹ CLIFF SWALLOW.—Common migrant; Mrs. Byrd observed the species in numbers on November 11, 1917, as described under *Progne subis*.

Hirundo rustica erythrogastris.² BARN SWALLOW.—Uncommon migrant; three seen by Mrs. Byrd, October 27, 1917.

¹ *P. lunifrons* of the A. O. U. Check-List.

² *H. erythrogastra* of the A. O. U. Check-List.

Iridoprocne bicolor. TREE SWALLOW.—Common winter resident; observed by Mrs. Byrd on October 12 and 27 and December 24, 1917; I saw small flocks of 10 to 20 birds flying northward over the everglades, January 18, 24, and 25, 1918.

Bombycilla cedrorum. CEDAR WAXWING.—Rare and irregular migrant; seen several times by Mr. Mosier.

Lanius ludovicianus ludovicianus. LOGGERHEAD SHRIKE.—Moderately common resident of the pine and prairie regions around Homestead; rare in the Hammock but has been seen there by Mr. Mosier.

Vireosylva olivacea. RED-EYED VIREO.—Uncommon migrant; seen by Dr. Burgess, December 26–28, 1917.

Vireosylva gilva gilva. WARBLING VIREO.—Uncommon migrant; one was seen, January 7, 1917, by Dr. Herbert R. Mills and Mr. Oscar E. Baynard.

Lanivireo solitarius solitarius. BLUE-HEADED VIREO.—Rare winter resident; one specimen taken, January 28, 1918; noted by Mrs. Byrd, January 7, 1917 and by Dr. Burgess, December 26–28, 1917.

Vireo griseus maynardi. KEY WEST VIREO.—Fairly common, both summer and winter, in the dense hammock jungle; noted in late December by Dr. Burgess and in late January by the writer; one was heard singing February 1, 1918. Specimens of this race were taken on February 2 and June 17, 1918.

Vireo griseus griseus. WHITE-EYED VIREO.—A specimen of this northern race was taken in the Hammock, January 25, 1918.

Mniotilta varia. BLACK-AND-WHITE WARBLER.—Migrant and possible rare winter resident; noted by Mrs. Byrd, January 7, 1917.

Vermivora ruficapilla ruficapilla. NASHVILLE WARBLER.—Migrant and rare winter resident; individuals were noted by Mrs. Byrd, October 12 and 27, and December 24, 1917; also by Dr. Burgess, December 26–28, 1917. Mrs. Byrd has seen the species a number of times at Silver Palm Hammock, near Princeton, and has identified specimens caught by a cat.

Vermivora celata celata. ORANGE-CROWNED WARBLER.—Rare winter resident; one seen by Mrs. Byrd, January 4, 1918.

Compsothlypis americana subsp. PARULA WARBLER.—Occasional in migration; seen on numerous occasions by Mrs. Byrd.

Dendroica caerulescens. BLACK-THROATED BLUE WARBLER.—Reported quite common by Mr. Mosier, October 18, 1918; arrived about October 5.

Dendroica coronata coronata. MYRTLE WARBLER.—Common winter resident, found in open timber, scrubby tracts, and along roadsides. Observed in numbers by Mrs. Byrd, December 24, 1917 and by the writer, January 24–February 5, 1918.

Dendroica dominica dominica. YELLOW-THROATED WARBLER.—Rare winter resident; noted by Mrs. Byrd, January 7, 1917.

Dendroica vigosii. PINE WARBLER.—Common resident of the pine-lands between Florida City and Royal Palm Hammock and on Long Pine

Key; has been seen in the Hammock by Mosier. The birds were heard singing on January 24 and 28, 1918; a full-grown young bird was collected on June 13.

***Dendroica palmarum palmarum*. PALM WARBLER.**—Common winter resident in the open parts of the Hammock and along roadsides in the pineland. Observed by Mrs. Byrd, October 20 and 27, 1917; by Dr. Burgess, December 26–28, 1917 and by the writer, January 15–February 5, 1918. In January, several birds came regularly to feed at a feeding stand near the Park lodge.

***Dendroica discolor*. PRAIRIE WARBLER.**—Rare winter resident; observed by Dr. Burgess, December 26–28, 1917. The species breeds on the coast near Florida City, but not, so far as known, in the vicinity of the Hammock.

***Seiurus aurocapillus aurocapillus*. OVEN-BIRD.**—Fairly common winter resident; noted by Mrs. Byrd, October 20 and 28, 1917, by Dr. Burgess, December 26–28, 1917, and by the writer, January 15–February 5, 1918. Most of the birds stay in the dense jungle and they are so quiet and retiring that it is difficult to say how numerous they are. Two birds living near the Park lodge became very tame, coming to the doorstep and the feeding stand to pick up crumbs and at times almost walking over an observer's feet. One bird was caught in a mouse trap set in palmetto scrub in a clearing.

***Seiurus noveboracensis* subsp. WATER THRUSH.**—Mrs. Byrd reports seeing large numbers of these birds along ditches in the Park one day in fall (date not recorded). Wetmore saw one in the Hammock, February 21, 1919.

***Geothlypis trichas ignota*. FLORIDA YELLOW-THROAT.**—Occurs in small numbers, both in winter and summer, in patches of sawgrass or rushes on the glades, or in dense palmetto scrub in the Hammock. Specimens taken.

***Setophaga ruticilla*. REDSTART.**—Migrant; Mosier states that a swarm of Redstarts invaded the Hammock about May 1, 1918, for a week. [A warbler heard singing in the heavy jungle on June 13 sounded somewhat like this species, but it could not be satisfactorily identified.]

***Mimus polyglottos polyglottos*. MOCKINGBIRD.**—Occurs in small numbers in winter in the Hammock, and more commonly on Long Pine Key; none bred in the Hammock in 1918 and only one was observed on Long Pine Key. In January, the first song was heard on the 26th and on January 30, one bird was singing vigorously.

***Dumetella carolinensis*. CATBIRD.**—Fairly common winter resident in the Hammock and on Long Pine Key.

***Thryothorus ludovicianus miamensis*. FLORIDA WREN.**—Common resident of the dense hammock jungle, less conspicuous in winter; found also on Long Pine Key. In late January songs were occasionally heard in the early morning; in June the birds sing at any time of day.

Troglodytes aedon (subsp.?). HOUSE WREN.—Rare winter resident; single birds were noted by Mrs. Byrd, January 7, 1917, by Dr. Wetmore, February 21 and 23, 1919, and by the writer (on Long Pine Key), January 24 and 28, 1918.

Cistothorus stellaris. SHORT-BILLED MARSH WREN.—Two individuals were observed, January 24, 1918, in dense grass on the glades; they flushed several times at close range and flying a short distance, settled into the grass again.

Telmatoodytes palustris iliacus. PRAIRIE MARSH WREN.—Uncommon winter resident; one or two seen frequently in January in patches of reeds on the glades; a specimen taken January 29, 1918, is referable to this form.

Certhia familiaris americana. BROWN CREEPER.—Rare winter resident; Mosier states that he has several times seen this bird in the Hammock in March and April.

Sitta carolinensis carolinensis. WHITE-BREASTED NUTHATCH.—Rare migrant; Mosier sees a few in the Hammock every spring and fall.

Sitta pusilla. BROWN-HEADED NUTHATCH.—Resident in small numbers in the pineland east of the Hammock; several specimens, adult and full-grown young, were taken there, June 13, 1918.

Baeolophus bicolor. TUFTED TITMOUSE.—Has been seen once in the Hammock by Mrs. Byrd—date not recorded.

Corthylio calendula calendula. RUBY-CROWNED KINGLET.—Rare winter resident; one observed by Mrs. Byrd, January 4, 1918.

Polioptila caerulea caerulea. BLUE-GRAY GNATCATCHER.—Uncommon winter resident; noted by Mrs. Byrd, January 7, 1917, by Dr. Burgess, December 26-28, 1917; by Dr. Wetmore, February 21-27, 1919; and by myself, January 18-28, 1918.

Hylocichla guttata pallasii. HERMIT THRUSH.—Rare winter resident; one was seen, January 26 and 30, 1918, around the edge of the clearing near the Park lodge; noted also by Dr. Burgess, December 26-28, 1917.

Planesticus migratorius migratorius. ROBIN.—Moderately common winter resident; small numbers seen in the Hammock on several days in late January and a flock of about 25 on Long Pine Key, January 28, 1918; noted by Mrs. Byrd, January 7 and December 24, 1917, and by Dr. Wetmore, February 21-26, 1919. Specimens taken January 24 and 28, 1918, proved to belong to the northern race.

Sialia sialis sialis. BLUEBIRD.—Fairly common resident in the pineland east of the Hammock where adults and full-grown young were seen June 13, 1918; two pairs were seen on Long Pine Key, January 24, 1918; a pair nested close to the lodge in the Hammock in the spring of 1918.

Biological Survey, U. S. Dept. Agr., Washington, D. C.

¹ *Regulus* of the A. O. U. Check-List.

SIXTH ANNUAL LIST OF PROPOSED CHANGES IN THE A. O. U. CHECK-LIST OF NORTH AMERICAN BIRDS.

BY HARRY C. OBERHOLSER.

THIS is the Sixth Annual List of Proposed A. O. U. Check-List additions and changes in the names of North American birds. Like the five already published,¹ the present list comprises only ornithological cases—*i. e.*, such as require specimens or the identification of descriptions for their determination—and consists of additions, eliminations, rejections, and changes of names due to various causes. However, only changes known to be the result of revisionary work are included; therefore no mention is here made of changes involved in names in local lists or elsewhere, used without sufficient explanation or not known to be based on original research, of changes or additions queried or but tentatively made, or of the elimination of subspecies by authors who, on general principles, recognize no subspecies. No action by the A. O. U. Committee has yet been taken on any of the proposed changes here listed; nor is any opinion beyond that of compiler herein expressed.

This list is intended to include everything pertinent up to December 31, 1920, and nothing after that date has been taken. In view of the volume and widely scattered character of current ornithological literature, it is not at all unlikely that some names or changes have been overlooked, and the writer would be very thankful for reference to any omissions, in order that such may be duly given a place in next year's list.

ADDITIONS AND CHANGES IN NAMES.²

Colymbus holboellii (Reinhardt) becomes ***Colymbus grisegena holboellii*** (Reinhardt), because only subspecifically distinct from *Colymbus grisegena*. (Cf. Hartert, *Vögel paläarkt. Fauna*, Heft XI-XII [Band II, 5-6], August, 1920, p. 1449.)

¹ For these previous lists, see 'The Auk,' XXXIII, October, 1916, pp. 425-431; XXXIV, April, 1917, pp. 198-205; XXXV, April, 1918, pp. 200-217; XXXVI, April, 1919, pp. 266-273; XXXVII, April, 1920, pp. 274-285.

² Additions to the A. O. U. Check-List, the Sixteenth and Seventeenth Supplements, and the First to Fifth Annual Lists are marked with a dagger (†). Generic (and subgeneric) names so indicated have not hitherto stood in the lists in either generic or subgeneric sense.

- †*Atalolestris* Mathews. New subgenus (of *Stercorarius*). Mathews, Birds Australia, II, pt. 5, January 31, 1913, p. 500; type by original designation and monotypy, *Stercorarius longicaudus* Vieillot.
- Thalassarche culminata culminata* (Gould) becomes *Thalassarche chrysostoma* (Forster), because both these specific names are considered to be applicable to the same bird, and the latter has priority. (Cf. Hartert, Vögel paläarkt. Fauna, Heft XI-XII [Band II, 5-6], August, 1920, p. 1442.)
- Puffinus l'herminieri* Lesson becomes *Puffinus assimilis l'herminieri* Lesson, because but a subspecies of *Puffinus assimilis*. (Cf. Hartert, Vögel paläarkt. Fauna, Heft XI-XII [Band II, 5-6], August, 1920, p. 1422.)
- Anas platyrhynchos* Linnaeus becomes *Anas boschas* Linnaeus, because the former name is not certainly identifiable. (Cf. Chernel von Chernelhazy, Nomencl. Avium Regni Hungariae, 1918, pp. 63, 69.)
- †*Anas novimexicana* Huber. New species. Huber, THE AUK, XXXVII No. 2, April, 1920, p. 273 (Rio Grande, west of Las Cruces, Dona Ana County, New Mexico). Range: Rio Grande Valley in New Mexico.
- Marila marila* Linnaeus becomes, so far as North America is concerned, *Nyroca marila nearctica* (Stejneger) (*Aythya*). *marila nearctica* Stejneger, Bull. U. S. Nat. Mus., No. 29, 1885, p. 161; Nearctic Region: Arctic Coast to Guatemala), since the North American bird proves to be subspecifically distinct from that of the Old World. (Cf. Hartert, Vögel paläarkt. Fauna, Heft X [Band II, Heft 4], March, 1920, p. 1344.)
- Melanitta deglandi* (Bonaparte) becomes *Melanitta fusca deglandi* (Bonaparte) because considered only subspecifically distinct from *Melanitta fusca*. (Cf. Hartert, Vögel paläarkt. Fauna, Heft XI-XII [Band II, 5-6], August, 1920, p. 1357.)
- Melanitta deglandi dixonii* (Brooks) becomes *Melanitta fusca dixonii* (Brooks) because considered only subspecifically distinct from *Melanitta fusca*. (Cf. Hartert, Vögel paläarkt. Fauna, Heft XI-XII [Band II, 5-6], August, 1920, p. 1357.)
- Chen hyperboreus nivalis* (Forster) becomes *Chen caerulescens nivalis* (Forster), because of the merging of *Chen hyperboreus* with *Chen caerulescens*. (Cf. Hartert, Vögel paläarkt. Fauna, Heft X [Band II, Heft 4], March, 1920, p. 1292.)
- Branta nigricans* (Lawrence) becomes *Branta bernicla nigricans*, since it is considered only subspecifically different. (Cf. Hartert, Vögel paläarkt. Fauna, Heft X [Band II, Heft 4], March, 1920, p. 1295.)
- †*Rallus longirostris insularum* Brooks. New subspecies. Brooks, Proc. New England Zool. Club, VII, June 24, 1920, p. 53 (Big Pine Key, Florida). Range: Florida Keys, Florida.
- †*Rallus longirostris helius* Oberholser. New subspecies. Oberholser, Proc. Biol. Soc. Wash., XXXIII, July 24, 1920, p. 33 (sixth key in

the Newfound Harbor group, southwest of Big Pine Key, Florida).
Range: Florida Keys.

Gallinago Koch becomes **Capella** Frenzel (Besch. Vögel und Eyer Gegend Wittenberg. Naturg. Churkr., 1801, p. 58; type by monotypy, *Scolopax caelestis* Frenzel) because of equal pertinence and earlier date. (Cf. Mathews and Iredale, Austral Avian Record, IV, Nos. 4-5, December 16, 1920, p. 131.) The North American forms of the genus *Gallinago* will therefore now become

Capella gallinago gallinago (Linnaeus).

Capella gallinago delicata (Ord).

Capella media (Latham).

†**Limnocyptes gallinula** (Linnaeus). **Scolopax gallinula** Linnaeus, Syst. Nat., ed. 12, I, 1766, p. 244 ("Europae paludibus"). Obtained on St. Paul Island, Pribilof Islands, Alaska. (Cf. Hanna, Condor, XXII, No. 5, September 24, 1920, p. 173.)

Canutus canutus (Linnaeus) becomes **Canutus canutus rufus** (Wilson) because the American bird is subspecifically separable from that of the Old World. (Cf. Hartert, Vögel paläarkt. Fauna, Heft XI-XII [Band II, 5-6], August, 1920, p. 1588.)

†**Squatarola squatarola hypomela** (Pallas). *Charadrius hypomelus* Pallas, Reise versch. Prov. Russ. Reichs, III, 1776, p. 699 ("paludes borealis orae"). (Cf. Hartert, Vögel paläarkt. Fauna, Heft XI-XII [Band II, 5-6], August, 1920, pp. 1554-1555.) Range: Breeds in northeastern Asia and Alaska; migrates to Ceylon, New Zealand, and Peru.

†**Lagopus leucurus rainierensis** Taylor. New subspecies. Taylor, Condor, XXII, No. 4, August 10, 1920, p. 146 (Pinnacle Peak, 6200 feet altitude, Mount Rainier, Wash.). Range: Cascade Mountains of Washington.

Elanus leucurus (Vieillot) becomes **Elanus axillaris majusculus** Bangs and Penard, new subspecies (*Elanus leucurus majusculus* Bangs and Penard, Proc. New England Zool. Club, VII, February 19, 1920, p. 46; San Rafael, Calif.), because of this new race, and because *Elanus leucurus* is regarded as a subspecies of *Elanus axillaris* (Latham) (cf. Swann, Synopt. List Accipitres, III, 1920, p. 103.)

†**Buteo lineatus extimus** Bangs. New subspecies. Bangs, Proc. New England Zool. Club, VII, January 16, 1920, p. 35 (Cape Florida, Fla.). Range: Florida Keys, Florida.

†**Hierofalco rusticolus islandus** (Brünnich). Recorded from southern Greenland and northeastern North America (cf. Swann, Synopt. List Accipitres, III, 1920, p. 103), and thus reinstated as a North American bird.

Aeronautes melanoleucus Baird becomes **Aeronautes saxatalis** (Woodhouse) (*Acanthylis saxatalis* Woodhouse, in Sitgreaves' Report Exped. Zuni and Colo. Riv., 1853, p. 64; Inscription Rock, New Mexico), because the latter name is of equal pertinence and earlier date. (Cf. Oberholser, THE AUK, XXXVII, No. 2, April, 1920, p. 294.)

- Tyrannus dominicensis*** (Gmelin) becomes ***Tyrannus curvirostris*** (Hermann) (*Sitta curvirostris* Hermann, *Tabula Affinit. Anim.*, 1783, p. 204; Jamaica), because the latter name is of equal pertinence and earlier date. (Cf. Stresemann, *Novit. Zool.*, XXVII, No. 1, June 15, 1920, p. 329.)
- †***Otocoris alpestris sierrae*** Oberholser. New subspecies. Oberholser, *Condor*, XXII, No. 1, January 26, 1920, p. 34 (head of Pine Creek, Lassen County, California). Range: Breeds in the northern Sierra Nevada, California; winters also in the Sacramento Valley, California.
- †***Perisoreus canadensis albescens*** Peters. New subspecies. Peters, *Proc. New England Zool. Club*, VII, May 4, 1920, p. 51 (Red Deer, Alberta, Canada). Range: Southern Alberta.
- †***Perisoreus barbouri*** Brooks. New species. Brooks, *Proc. New England Zool. Club*, VII, March 11, 1920, p. 49 (Ellis Bay, Anticosti Island, Gulf of St. Lawrence, Quebec, Canada). Range: Anticosti Island, Quebec.
- †***Euphagus cyanocephalus minusculus*** Grinnell. New subspecies. *Condor*, XXII, No. 4, August 10, 1920, p. 153 (Palo Alto, Santa Clara County, California). Range: California.
- †***Passerella iliaca annectens*** Ridgway, *THE AUK*, XVII, No. 1, January, 1900, p. 30 (Yakutat, Alaska). Revived as a subspecies for the breeding Fox Sparrows from Cross Sound to Prince William Sound, Alaska. (Cf. Swarth, *Univ. Calif. Publ. Zool.*, XXI, No. 4, September 11, 1920, pp. 140-144.)
- †***Passerella iliaca sinuosa*** Grinnell, *Univ. Calif. Publ. Zool.*, V, No. 12, March 5, 1910, p. 405 (Drier Bay, Knight Island, Prince William Sound, Alaska). Recognized as a subspecies for the breeding Fox Sparrows of the Prince William Sound region and the Kenai Peninsula, Alaska. (Cf. Swarth, *Univ. Calif. Publ. Zool.*, XXI, No. 4, September 11, 1920, pp. 135-140.)
- †***Petrochelidon albifrons hypopolia*** Oberholser. New subspecies. Oberholser, *Canadian Field Naturalist*, XXXIII, No. 5, Nov., 1919 (Jan. 3, 1920), p. 95 (Fort Norman, Mackenzie, Canada). Range: Breeds from Montana to Alaska; migrates through Wyoming and California, probably to South America.
- †***Lanius ludovicianus mearnsi*** Ridgway, *Proc. Biol. Soc. Wash.*, XVI, Sept. 30, 1903, p. 108 (San Clemente Island, Calif.). Revived as a subspecies. (Cf. Oberholser, *Wilson Bulletin*, XXXI, No. 3, Sept., 1919, p. 89.) Range: San Clemente Island, California.
- †***Thryomanes bewickii cerroensis*** (Anthony). *Thryothorus cerroensis* Anthony, *THE AUK*, XIV, No. 2, April, 1897, p. 166 (Cerro Island, Lower California). Revived as a subspecies to include the breeding Bewick Wrens from middle Lower California. (Cf. Oberholser, *Wilson Bulletin*, XXXII, No. 1, March 27, 1920, p. 21.)

- †**Thryomanes bewickii ariborius** Oberholser. New subspecies. Oberholser, Wilson Bulletin, XXXII, No. 1, March 27, 1920, p. 25 (Agassiz, British Columbia). Range: southwestern British Columbia and northwestern Washington.
- Cyanosylvia** Brehm becomes **Luscinia** Forster (Synopt. Cat. Brit. Birds, 1817, p. 14; type by monotypy and tautonymy, *Motacilla luscinia* Linnaeus), because not generically separable. (Cf. Hartert, Pract. Handb. Brit. Birds, pts. 7-8, April 8, 1920, p. 467.)

REJECTIONS AND ELIMINATIONS.¹

- ***Puffinus griseus stricklandi** Ridgway = **Puffinus griseus** (Gmelin). (Cf. Hartert, Vögel paläarkt. Fauna, Heft XI-XII [Band II, 5-6], August, 1920, p. 1426.)
- ***Puffinus griseus chilensis** (Bonaparte) = **Puffinus griseus** (Gmelin). (Cf. Hartert, Vögel paläarkt. Fauna, Heft XI-XII [Band II, 5-6], August, 1920, p. 1426.)
- ***Phalacrocorax carbo americanus** Reichenbach = **Phalacrocorax carbo carbo** (Linnaeus), because not subspecifically distinct. (Cf. Hartert, Vögel paläarkt. Fauna, Heft XI-XII [Band II, 5-6], August, 1920, pp. 1387-1388.)
- ***Phalacrocorax pelagicus robustus** Ridgway = **Phalacrocorax pelagicus pelagicus** Pallas, because not subspecifically different. (Cf. Hartert, Vögel paläarkt. Fauna, Heft XI-XII [Band II, 5-6], August, 1920, p. 1393.)
- ***Querquedula discors albinucha** Kennard = **Querquedula discors** (Linnaeus). Eliminated, because considered a difference of age or a color phase. (Cf. Arthur, THE AUK, XXXVII, No. 1, January, 1920, pp. 126-127.)
- ***Somateria mollissima islandica** Brehm = **Somateria mollissima mollissima** (Linnaeus), as considered not separable. (Cf. Hartert, Vögel paläarkt. Fauna, Heft XI-XII [Band II, 5-6], August, 1920, pp. 1367-1368.)
- ***Chen hyperboreus hyperboreus** (Pallas) = **Chen caerulescens caerulescens** (Linnaeus), because only a color phase. (Cf. Hesse, Journ. f. Ornith., LXIII, Heft 2, 1915, pp. 158-160; Hartert, Vögel paläarkt. Fauna, Heft X [Band II, Heft 4], March, 1920, p. 1291.)
- Branta canadensis hutchinsii** (Richardson) vs. **Branta canadensis** (Linnaeus). Proposed slimination as a subspecies (cf. Figgins, THE AUK, XXXVII, No. 1, January, 1920, pp. 94-102) rejected. (Cf. Swarth, THE AUK, XXXVII, No. 2, April, 1920, pp. 268-272).

¹ Eliminations from the A. O. U. Check-List, the Sixteenth and Seventeenth Supplements, and the First to Fifth Annual Lists, are designated by an asterisk (*). Generic (and subgeneric) names so marked are merely discontinued in both generic and subgeneric sense, while the species included under them remain in the lists.

Branta canadensis occidentalis (Baird) vs. **Branta canadensis** (Linnaeus). Proposed elimination as a subspecies (*cf.* Figgins, *THE AUK*, XXXVII, No. 1, January, 1920, pp. 94-102) rejected. (*Cf.* Swarth, *THE AUK*, XXXVII, No. 2, April, 1920, pp. 268-272).

Branta canadensis minima Ridgway vs. **Branta minima** Ridgway. Proposed change in status (*cf.* Figgins, *THE AUK*, XXXVII, No. 1, January, 1920, pp. 94-102) rejected. (*Cf.* Swarth, *THE AUK*, XXXVII, No. 2, April, 1920, pp. 268-272).

Biological Survey, U. S. Dept. Agr., Washington, D. C.

GENERAL NOTES

A Loon (*Gavia immer*) Caught on a Fishing Line.—Under this heading, Mr. Verdi Burtch in 'The Auk' for April, 1920, calls attention to the capture of a Loon, while trolling for bass. Though I have never taken any of our loons while trolling, I have caught a score or more while fishing with live bait, in the waters of San Diego Bay. There have been times, when live bait was not easily obtained, that the Loons were quite annoying and could have been taken almost as easily as the bass or sea trout, which were the real objective.

The Red-throated Loon was as often captured as its larger relation and either never failed to furnish a lively fight before being at last "brought to gaff."

In every case where I have hooked a Loon, the bait was taken near the bottom and with a run, that led me to think I had to deal with one of the several species of shark, that abound in these waters. The bird seldom, if ever came to the surface with the bait—usually a smelt—before it had been hooked and then only for air. They always furnished abundance of "fight" and usually taxed rod and reel to the limit. At times when an attempt was made to escape along the surface of the water, I found that the strain on the line was reduced at least 50%. From the fact that the hook was often well down in the throat, I think that fish are often swallowed without coming to the surface.—A. W. ANTHONY, *Natural History Museum, Balboa Park, San Diego, Calif.*

Dovekie (*Alle alle*) at Wallop's Island, Va.—An immature female Dovekie was taken on an oyster rock at low tide near Wallop's Island, about five miles from Chincoteague, Va., on February 2, 1921, and is now in my possession. A small flock of these birds had been reported previously several miles out in the ocean east of the town.—B. H. WARREN, *West Chester, Pa.*

King Eider (*Somateria spectabilis*) in Pennsylvania.—Through the courtesy of Mr. Boyd P. Rothrock, curator of the Pennsylvania State Museum, Harrisburg, Pa., I am able to report the capture of four specimens of the King Eider, on the Susquehanna River at a point opposite Harrisburg, not far from West Fairview, on December 7, 1920. Mr. Rothrock writes me that an assistant of his sighting five ducks, which he at first took to be Canvasbacks, paddled out to within shooting distance and with a Winchester pump gun secured four of them. Three of these are females and one a young male showing a considerable amount of white on the breast. The male and one of the females were sent to me for examination by Mr. Rothrock and thanks to his generosity the latter is now in the Pennsylvania study series at the Academy of Natural Sciences, Philadelphia, while the other three are being mounted at the State Museum.

Curiously enough on January 11, 1921, Mr. Brent M. Morgan of Washington, D. C., sent me a clipping from an issue of the 'Liverpool [Pa.] Sun,' published early in the present year in which it is stated that: "B. F. Lower, while poling a boat along the river one day last week was fortunate enough to kill a large Eider duck with his pole. The wild Eider duck is a rare species in this vicinity and has a beautiful plumage."

Liverpool is in Snyder County, about thirty miles above Harrisburg, on the west side of the Susquehanna, so that it would seem that there were more Eiders present than those reported by Mr. Rothrock. Requests for further information from the editor of the paper have met with no response, but the allusion to the beauty of the plumage would seem to indicate the presence of an adult male. So far as I am aware this is the first record of the King Eider for the State, with the exception of the flock reported by Dr. Warren on Erie Bay, November 30, 1889 (*Birds of Pennsylvania*, 2nd ed. p. 46.).—WITMER STONE, *Academy of Natural Sciences, Philadelphia*.

The Blue Goose in the Province of Quebec.—On October 10, 1917, an adult Blue Goose (*Chen caerulescens*) was shot by Mr. Charles Frémont, of Quebec, P. Q., at Cap Tourmente, Montmorency County, P. Q. Cap Tourmente is on the north shore of the St. Lawrence River, about twenty-five miles below Quebec City. The Blue Goose was with a flock of Greater Snow Geese (*Chen hyperboreus nivalis*) when taken.

On October 16, 1920, a juvenile Blue Goose was shot at the same place by Mr. H. des Rivières of Quebec, P. Q. This bird also was in the company of a flock of Greater Snow Geese when taken. Mr. des Rivières informs me that the Greater Snow Geese would not permit the Blue Goose to mingle freely with them, but kept it always at a distance of at least several feet from their flock.

Both of these Blue Geese were taken in the flesh to Mr. C. E. Dionne, curator of the museum of Laval University, Quebec, P. Q., by whom they were mounted. They were not sexed. When seen by me they were mounted and were in the possession of Mr. Frémont and Mr. des

Rivières, respectively. They were identified by me within a short time after I had examined the series of skins of Blue Geese and Snow Geese in the possession of Mr. J. H. Fleming, of Toronto, Ont. I completed the identification of Mr. des Rivières' juvenile bird by writing down a detailed description of the specimen while it was before me and later comparing the description, in Toronto, with a skin of a juvenile Blue Goose in Mr. Fleming's possession.

There appear to be no previous records of the Blue Goose in the Province of Quebec.—HARRISON F. LEWIS, *Bergerville, P. Q.*

Blue Geese (*Chen caerulescens*) in Massachusetts.—The following records of Blue geese taken in Massachusetts do not seem to have been reported.

One (sex?) shot at Long Point, Silver Lake, Plympton, Mass., late in November, 1914. The specimen was mounted and is now kept in a camp at Oldham Pond, Pembroke.

One (sex?) shot at Accord Pond, South Hingham, Mass., October 29, 1920. Specimen not saved, but seen by Mr. A. B. Gardner after it had been plucked for use as food. JOHN C. PHILLIPS, *Wenham, Mass.*

Massachusetts Geese.—The autumn of 1920 was remarkable for what was probably the largest flight of Canada Geese that has been seen in eastern Massachusetts, at least in recent times. Geese started moving the first week in October, and this early flight was large. There seem to have been very few days from early October to early January of the present year that flocks were not seen at some point between Weymouth and Duxbury. The November flight started early and lasted with very little interruption the rest of the month, the bulk probably passing between November 20 and 26, during which period there was continual "dirty" weather; sleet, snow, fog, north-east and north gales. These extremely unfavorable conditions for migration forced geese into small ponds, marshes, and even fields, so exhausted did they become. Consequently many were shot outside the regular goose "stands," how many we cannot tell. It was remarked by Massachusetts gunners that there seemed to be a large proportion of young geese, and the same was true of Currituck Sound, N. C.; where geese also appeared in unusual numbers and were very tame. The tameness of the geese in Massachusetts this past season caused comment everywhere, and I saw instances of it myself.

The figures which I have gathered on the numbers taken are not complete, but they do include nearly all the largest shooting stands. Added together they give a total of 4749 for eastern Massachusetts, without allowing anything for numbers killed on small ponds, or during flight. This may bring the number actually shot up to 5000. It is interesting to compare this with a count taken on three other years in the same way. In 1908 about 1450, in 1909 about 1900, and in 1911 about 3518, this last being the biggest year up to that time ('The Auk,' 1912, p. 390).

In 1910 ('The Auk,' p. 268) I pointed out that the average yearly number of geese seen from a single point at Oldham Pond, Pembroke was 1145. This year 2876 geese were seen at this same place, and at least 1400 of them came into the pond. This count does not include some flocks that came in and went out during the night.

I suggested in 1912 that our Atlantic coast flight of Canada Geese showed signs of being on the increase. I think now that there is no doubt about this. The numbers taken this year seem to some people excessive, but the chance to shoot so many will probably not occur again in many years. The favorable conditions were due to a combination of a great breeding year, with a heavy flight, which happened to meet extremely hard weather after it had started. In Labrador the past season has been one of great scarcity of foxes, following one of the cycles in which mice and rabbits die off in great numbers. This may have something to do with an extra successful breeding year for geese resulting in large numbers of young.

It is quite interesting to compare our Massachusetts figures with those which I have recently seen for the State of Minnesota. The hunters of that state have reported only 2330 Canada Geese shot during the two years 1919-1920 (MS. of State Game Comm. Report).

Some geese having heavy oil, of a black, tarry consistency on their underparts, were shot in Massachusetts ponds last autumn. I saw one or two geese shot with this oil upon them at Currituck Sound, N. C., in December, and I heard of several others taken there in the same plight.

Swans were again reported in Massachusetts. Two flocks, one of eleven, and one of seven came into Duxbury Bay, but I have not the dates.—JOHN C. PHILLIPS, *Wenham, Mass.*

The Whistling Swan (*Olor columbianus*) on the coast of South Carolina.—About three o'clock P. M., on January 17, 1921, my wife called my attention to a very large white bird flying over our yard and about to alight in the water near our house while we were sitting on the piazza. I cautiously approached the place under cover and to my astonishment found the huge bird to be an adult Swan. I then retreated and went back into the house for my gun and glasses, came back under cover and approached it to within 150 feet and saw it feeding by immersing its long neck under the water. I watched this bird through good glasses hoping to see the position of the nostrils, but was unable to do so nor did I have the heart to shoot so beautiful a bird. It was an enormous bird and may have been an example of the very rare Trumpeter Swan (*Olor buccinator*) for which there is no South Carolina record. The bird was constantly on the alert and finally flew away in a southerly direction.

The Whistling Swan—which I suppose this bird must have been—is rare in South Carolina, but I have in my collection a young bird of the year taken at Ridge Springs, Edgefield County, South Carolina, on November 26, 1907, which was given to me by Dr. Jonathan Dwight, and

recorded by me in 'The Auk,' XXV, 1908, 217-218. ARTHUR T. WAYNE, *Mount Pleasant, South Carolina.*

Whistling Swan—A Correction.—Through a typographical error my record of *Olor columbianus*, Whistling Swan, at Elizabeth, N. J., October 29, 1916, on p. 120, January 'Auk' appeared without a question mark, and as it turns out, the identification was wrong. Mr. W. De W. Miller, of the American Museum of Natural History, to whom I reported the capture of the bird, also saw it and he has kindly notified me that the specimen (a young bird) was not *O. columbianus* but was *Cygnus olor*, the Mute Swan, which he states is now naturalized and wild on the Hudson River and the coast of New Jersey. Dr. Stone also informs me that one of this species was found dead on the ice at Beach Haven, N. J., January 8, 1920 and that another obtained on the south Jersey coast narrowly escaped being published as a Trumpeter! Swan records of the future must evidently be carefully scrutinized.—CHARLES A. URNER, *Elizabeth, New Jersey.*

An Egret (*Herodias egretta*) Record from Oswego County, N. Y.—While recently examining a small local collection of mounted birds, I was somewhat surprised to find an excellently preserved specimen of the Egret. The bird was shot in August, 1887, at Mexico Point, Lake Ontario, by E. E. Chapman of this village. Although there are a number of published records of the occurrence of this species in the interior of New York, it must be remembered that the Egret is only an occasional summer visitant here, and that its presence at any time is at once worthy of note.

The present specimen was apparently mounted by a good taxidermist, and has been carefully kept all these years in a glass case. The plumage is remarkably white; moreover, the black of the legs and feet, the yellow bill with its blackish tip, and the orange lores—all appear as fresh as though the bird had been taken only recently. Inasmuch as the case could not be opened, it was possible to estimate, only, the total length, etc., of the mounted bird; however, it was evident that its measurements would be about the minimum usually given for the species. THOMAS L. BOURNE, *Hamburg, N. Y.*

A Late Record for the Red-backed Sandpiper.—While collecting on a small island near Gimli, Lake Winnipeg, Manitoba, June 27, 1916, I secured a finely plumaged Red-backed Sandpiper (*Pelidna alpina sakhalina*). This record hitherto unpublished is interesting because of the appearance of this arctic species at a point only fifty miles north of Winnipeg at a time so late. The individual was an adult male showing no abnormality or sign of recent recovery from injuries and having gonads highly developed. J. NELSON GOWANLOCK, *Hull Zoological Laboratory, University of Chicago, Chicago.*

Sanderling on Nantucket in December.—My son Captain George H. Mackay, Jr., while shooting on December 24, 1920 at Nantucket,

Massachusetts, saw four Sanderlings, which were feeding on the beach. He approached within twenty yards of them before they flew. This is a second winter record as I made another some years ago which was recorded in 'The Auk' at the time.—GEO. H. MACKAY, *Boston, Mass.*

A Very Late Record of the Passenger Pigeon (*Ectopistes migratorius*).—A mounted specimen of the Passenger Pigeon acquired by the late F. S. Daggett, in January, 1920, and now in the Daggett Collection, deposited in this Museum, bears the following label: "Passenger Pigeon, ♂, No. 315, Coll. of Geo. S. Hamlin. Shot by a Swede, North Bridgeport, Fairfield Co., Conn., Aug., 1906."

The specimen is in fine plumage, but atrociously mounted, with spread wings.

This is apparently one of the latest records of the species, but in some manner it has hitherto failed to receive attention and publication.—L. E. WYMAN, *Museum of History, Science and Art, Los Angeles, Calif.*

Three-toed Woodpecker in Michigan.—While on a hunting trip in Marquette County, Michigan, in the latter part of October, 1920, I was fortunate enough to secure a specimen of the Three-toed Woodpecker (*Picoides americanus americanus*). The bird was taken on the afternoon of October 18 at the southwestern end of Conway Lake, about a mile from the shore of Lake Superior and two miles from the Post Office of Huron Mountain.

The note of this woodpecker first attracted my attention to it and revealed its presence almost at the top of a very tall, dead tamarack. Its call note, which I mistook for that of the Arctic Three-toed Woodpecker, suggested very strongly the "squeak" of some small animal, and lacked the almost mechanical harshness of the note commonly uttered by Hairy and Downy Woodpeckers.

Speaking of the occurrence of this species in the state, Professor Barrows says (*Michigan Bird Life*, 1912, pp. 749-750)—"we are unable to find any record which can be authenticated." Mr. Norman A. Wood ('Auk,' Vol. XXX, p. 272) reports the finding of a specimen in a collection of mounted birds in the High School at Sault Ste. Marie, labeled "Soo, October 1, 1910; C. E. Richmond, collector.", and it seems a fair assumption that it was taken on the Michigan side of the Saint Mary's River. I have been unable to find, and Professor Barrows writes me that he does not know of, any other record of the taking of this species in the state.

The occurrence of *Picoides americanus americanus* so near the center of the south shore of Lake Superior suggests the possibility of its occurrence in the pine woods at other places south of the lake, though this region is not included in its range as given in the 'A. O. U. Check-List.' It does not seem probable that a non-migratory bird like this woodpecker would reach Marquette County from its normal range by crossing the lake, although the route via Isle Royal and Keweenaw Point would only require

a sustained flight of approximately forty miles. STEPHEN S. GREGORY JR., 456 Surf St., Chicago, Ill.

A Crowd of Hummers.—On May 1, 1920, after I had returned from a remarkable field trip, on which I had found 94 species of birds, one of my neighbors, Colonel B. F. Procter, called me to see the Ruby-throated Hummingbirds about a red-flowered horse-chestnut on his lawn. There was a continuous going and coming of the hummers, twenty or more being in sight all the time. I saw several perched on the smaller twigs of the tree, in addition to the group buzzing about the fragrant blossoms. Though these tiny birds came every day for a week, I never again saw so many at one time. I feel sure that I saw on that one day more individuals of this species than I have ever seen in any other whole season. This bird is usually so rare that I keep a record of every individual seen.—GORDON WILSON, Bowling Green, Kentucky.

Plumage of the Chimney Swift.—Dr. Wetmore's interesting article on the wing claws of *Chaetura pelagica*, in the December 'Condor,' reminded me of another curious fact regarding this bird.

In May, 1898, I put up a lot of skins of Chimney Swifts which had been suffocated in a chimney at Waukegan, Ill., and found concealed among the feathers of the abdomen at about the middle, a tuft of pure white down. This could only be noticed on parting the feathers, and was present in all of them but was lost or absorbed in making up the skins. Last Spring, while preparing a specimen (with the wings spread) my attention was called to a tract of naked black skin on the underside of the wing joint, and upon closer inspection, I found a single smoky black oval shaped feather growing from the center of the naked skin.

Upon examining a number of other specimens of *Chaetura pelagica*, and of *C. vauri* from California and *C. caudacuta* from New South Wales and Japan, the single feather was also found.—HENRY K. COALE, Highland Park, Ill.

Mortality among Chimney Swifts.—In 'The Auk', Vol. XXV, No. 3, pp. 317-318, July, 1908, under the heading "Curious fatality among Chimney Swifts," Mr. Ruthven Deane has recorded that some 700 Chimney Swifts (*Chaetura pelagica*) entered a chimney in the house of Dr. Maxson, Waukegan, Ill., during a heavy rainstorm, while gases from a furnace fire were passing off through the chimney. More than 100 of these birds were killed, and the rest were released while yet alive by the occupants of the house. In another chimney of the same house no Swifts were found at that time.

A destruction of Chimney Swifts in even greater numbers, at Truro, Nova Scotia, under circumstances similar, yet different, is described in the following extract from a letter dated June 1, 1919, addressed to me by Mr. E. C. Allen, now of Halifax, Nova Scotia, to whom I am indebted for permission to publish this note.

"We have had a week of dark and sometimes rainy weather, with strong, very cold north winds during the last half. Yesterday and the day before I noticed an occasional Chimney Swift beating up against the wind toward the First Presbyterian Church, in the large flues of which hundreds of them congregate. This morning I found a dead one on the steps of the Normal Science Building, and a few minutes later another was brought to me. Then I began to suspect trouble, and, after getting permission, visited the church. Twenty-two were picked up on the grounds, though, I was told, several had been carried off. Probably several will reach me tomorrow. Several others were reported about town. Then I went to the basement. There are really four flues. The furnace pipe enters one of these. From the opening at the base of this I took out 1175 dead and nearly dead, and approximately 100 living birds that could fly. Of the other three flues, one contained none, another about a dozen, and the third two dozen.

Now I had taken it for granted that the cause of the tragedy was starvation, as the birds feed entirely on the wing, and few or no insects have been flying this week. The janitor's theory was that the fire built this morning (the first for two weeks) had killed them, and I must say that the location of the greater part of the dead birds seems to substantiate his theory. But what of the others in the other two flues and about the grounds and town? Driven out by heat and smoke and died of cold perhaps. Or could it be that they all or nearly all sought the warm chimney this morning and succumbed to starvation?"

In a letter Mr. Allen informed me that he had examined the alimentary canals of several of the dead Swifts, and had found them entirely empty. HARRISON F. LEWIS, *Bergerville, P. Q.*

An Attack on Live Stock by Magpies (*Pica pica hudsonia*).—Last autumn, my friend, Mr. H. S. Betts of the Forest Service, Washington, D. C., visited the ranch of Mr. Keith Smith at Linwood, Utah. While in Madison, Mr. Betts stated that Magpies had attacked the sheep, and injured one so badly that it had to be killed. A request for detailed information, brought from Mr. Smith the following letter:

Linwood, Utah,
October 25, 1920.

"Dear Mr. Schorger:

"Referring to letter of the 16th inst., it is only in the past two years that the magpies have injured my rams and I have not heard of anyone else's stock being molested.

"Answering your questions:

"1. The wounds were always in the back, the magpie sitting there and pecking until it had opened up a small hole in the flesh. This got deeper and deeper until in one case the entrails of the ram were exposed.

2. The sheep were not wounded previous to the attack.

3. The magpies worked one at a time.

4. It is a rare occurrence as far as I know. They opened up sores on about ten out of sixty or seventy rams in the past two years.

5. They acted in a similar manner to two or three old thin cows last spring.

We treated the wounds with creolin and pine tar and tried to shoot and poison the magpies.

Yours very truly,

Keith Smith."

It is well known that Magpies are reputed to peck at sores on stock, but in this case uninjured sheep appear to have been attacked, and in one case, at least, severely. The point of greatest interest is the possible acquirement by the Magpie of the pernicious habit of the Kea Parrot.

Dr. H. C. Oberholser has kindly informed me that he is not aware of a similar occurrence.—A. W. SCHORGER, *Madison, Wisconsin*.

Strange behavior of a Bullock's Oriole.—In the early summer of 1920, a young lady, living near me, in eastern Oregon, picked up a young Bullock's Oriole, that had fallen from the nest. Though some time would have elapsed before the youngster would have begun its education under the care of its parents, there was no difficulty in rearing the bird, which soon became a recognized member of the family having the full liberty of the house. When it was several months old and had never exhibited the slightest fear of any human being, the family was surprised by its showing absolute terror, whenever its mistress entered the room dressed in a new dress, which had never been worn before in the presence of the bird. This seemed unreasonable, since it would fly for protection to any member of the family or even to strangers. After this fear had been several times exhibited and was evidently not to be treated lightly, it was suggested that a string of dark beads, which had until then been worn with the dress, might be responsible. When these were discarded the bird at once became normal and permitted its mistress the former liberties.

The sight of the beads, even if partly covered, on a dressing table, would always cause a panic. It is quite probable that the bird mistook them for a snake, in which case its fear was purely instinctive as no snake experience had ever entered the life of the youngster.—A. W. ANTHONY, *Natural History Museum, Balboa Park, San Diego, Calif.*

Domesticated Ipswich Sparrows (*Passerculus princeps*).—On December 26, 1920, four friends and I visited Duxbury Beach, south of Boston, Mass. As we approached one of the gunners' "blinds," which is occupied all through the shooting season, we flushed two Ipswich Sparrows. These flew a short distance toward the blind and dropped into the beach grass. We soon overtook and flushed them again. This performance was repeated several times, until finally the birds dropped upon the nearly bare sand close to the blind and on the edge of the group of tethered

ducks and geese belonging to the gunners. Here we were able to approach the sparrows close enough to observe them well without a glass. Later, one of the birds sat in plain sight on a beach plum bush for fully five minutes, allowing us to study him thoroughly from various angles. We were astonished at this behavior in a bird with so well earned a reputation for secretiveness and elusiveness. The explanation was, however, forthcoming. The gunners told us that these two sparrows came every day and fed among their captive fowl. In this way, apparently, they had come to be quite reconciled to "neighboring" with humans, indeed thought nothing of it!—HELEN GRANGER WHITTLE. *Cambridge, Mass.*

The Green-tailed Towhee (*Oberholseria chlorura*) on the coast of South Carolina.—On the afternoon of January 18, 1921, I went to the beach to see whether the Whistling Swan had come back to the place where I had seen it the previous afternoon, but instead of seeing it I saw a bird in my yard with a chestnut crown patch feeding in a thicket of lavender bushes near high water mark and which, at first glance, I took to be a Swamp Sparrow. As I had yet to see a Swamp Sparrow in *winter* plumage with a well marked chestnut crown patch, and as the bird at a distance looked much larger than a Swamp Sparrow, I lost no time watching it but went hurriedly to my house for my gun. Upon coming back to the place where I had last seen it I found this strange bird in an adjacent lot and shot it. Upon securing it I was amazed to find that I had taken a Green-tailed Towhee—a bird of the far western states. The specimen is an adult male in fine plumage and was very obese. This bird must have arrived in my yard sometime in November, 1920, as the migration of the Fringillidae is over before the last of that month.

The capture of this Green-tailed Towhee makes the sixteenth far western bird and the forty-fourth species that I have added to the fauna of South Carolina.

There is a Virginia record of this Towhee by Mr. G. C. Embury ('Auk,' XXV, 1908, 224) of a bird taken near Portsmouth on January 26, 1908, by Mr. John B. Lewis and in the collection of Mr. Embury. To what extent the list of South Carolina birds can be increased by the capture of far western birds there can be no conjecture.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

The Bohemian Waxwing in Iowa in Vast Numbers.—An article, showing such thorough investigation as does that one entitled "Bohemian Waxwings in New England" by the late Horace W. Wright, which was published in 'The Auk' for January, 1921, is certain to prompt reminiscence and review. Some of us recall the days when we, too, entertained the Bohemian Waxwing (*Bombycila garrula*) about our homes. Mr. Wright's article shows that the winter of 1908-1909 was a banner season for this species in the New England states, and a review of the literature on the subject reveals references to the appearance of this Waxwing in most of

the states in the northern tier from Washington to Maine, as well as in the Canadian provinces. Another fact, brought to light by this review, is that Montana is the only state from which the Bohemian Waxwing is reported regularly in the Christmas Bird Census.

It was in the winter of 1908-1909 that the most notable visit to Clayton County, Iowa, was made by this Waxwing. It was reported to have been seen in small flocks in several places. Most of my observations on these birds were made in our own dooryard or that of our nearest neighbor, where stood a mountain ash tree, loaded with berries. These observations were similar to those that have been published by others, therefore will not be repeated. But there was one feature of this visit quite out of the ordinary: On December 29, 1908, the day the Bohemian Waxwings arrived, a vast flock of birds was seen by two observers at points a half mile apart, and as there was a difference of about an hour in the time of the two observations there may have been two flocks or the first flock may have divided into smaller flocks. The first observer was Mr. Jerome Jones, who stated that soon after daylight a vast flock of birds flew over his head, "millions of them" he estimated; that they covered the sky and were several minutes in passing. When a boy, he had an interest in birds above the average, and is a man careful in his statements. The other observer was Mrs. D. A. Wright, whose description of the flock was written down soon after it passed and was substantially as follows: About eight o'clock in the morning she saw a flock, containing thousands of birds, fly northeast. They flew as closely together as birds ever do and covered a space from two hundred to three hundred feet in width and were two or three minutes in passing. She believed they were Bohemian Waxwings, nine of which for the following eighteen days frequented her mountain ash tree.

There seems to be no other species to which to assign the birds of this great flock. In corroboration of this conclusion we have this quotation "Professor Baird mentioned that Mr. Drexler saw 'millions' on Powder River, (Montana) in flocks rivalling in extent those of the Wild Pigeon." This is quoted in 'The Auk' for January, 1908, by E. S. Cameron in his account of the vast numbers of Bohemian Waxwings that visit Montana in winter. Again in 'The Auk' for October, 1917, Willoughby P. Lowe writes of this Waxwing: "The enormous quantities that visit Pueblo Co. [Colorado] during some winters is astonishing, densely packed flocks two miles long and a quarter of a mile wide occur. When a Pigeon Hawk dashes into their midst the sound of their wings must be heard to be appreciated."—ALTHEA R. SHERMAN, *National*, via McGregor, Iowa.

The Loggerhead Shrike (*Lanius ludovicianus ludovicianus*) seen Killing a Large Bird.—On December 17, 1920, while hunting in a teepelo swamp near my house I saw a Loggerhead of normal size attack and kill, a very large Phoebe (*Sayornis phæbe*). The attack was so quickly made that the Phoebe was dead before I could stop the Shrike.

I then waited for the Shrike to return, which it did almost at once, and struggled hard to carry its victim in its *claws*. It dropped it twice before finally carrying it to a thick-leaved live oak tree in the swamp. I then made the Shrike drop its prey and found that the bird was killed by the *claws* of the Shrike in the interscapular region. This Phoebe was a very large one measuring 7.5 inches in length and was very fat. Never before in all my experience have I seen a Loggerhead kill so large a bird. In the winter in South Carolina many Palm Warblers (*Dendroica palmarum palmarum*) fall victims to these hawk-like birds.—ARTHUR T. WAYNE, Mount Pleasant, S. C.

Orange-crowned Warbler in Boston in Midwinter.—On December 28, 1920, in the Arnold Arboretum, Boston, Mass., my husband and I found two Orange-crowned Warblers (*Vermivora celata celata*) feeding with five or six Chickadees. The birds kept in rather low, leafless shrubbery most of the half hour we had them under observation, but at times both Chickadees and Orange-crowns fed upon something found in the thick clusters of dried leaves hanging upon the white oaks. We were especially interested to find two of the warblers together, as most of the records for our section seem to be for single birds.—HELEN GRANGER WHITTLE, Cambridge, Mass.

The Proper Name of the Pine Warbler.—The confusion of the Pine and Blue-winged Warblers by the early writers, owing to the poor quality of Catesby's plate of the former, is well known, as is also the fact that Linnaeus, who never saw either species, supposed when he published the name *Certhia pinus* that he was naming the Pine Creeper of Catesby, whereas his description, taken from Edwards, was based upon the Blue-wing. His name *pinus* has therefore, very properly, always been applied to this latter species.

Alexander Wilson in 1811 untangled the confusion and clearly separated Catesby's Pine Creeper which he called *Sylvia pinus*, his specific name being current for seventy-five years. Then, in 'The Auk' for 1885, p. 343, Dr. L. Stejneger reviewed the subject stating that Wilson "well aware of the term *Sylvia pinus* did not intend it as a new name, but simply restricted it to Catesby's bird." He therefore proposed to drop Wilson's name and adopt *vigorsii* of Audubon.

Only two authors actually used the term "*Sylvia pinus*" prior to Wilson and these were Latham and Vieillot who were simply transferring Linnaeus' "*Certhia pinus*" to the genus to which, at that time, it belonged.

Now Wilson may have intended to "restrict" the earlier name but it is much more likely that he intended to name Catesby's bird "*Sylvia pinus*," regardless of what anyone else had done, and that is precisely what he did. As he nowhere mentions *Certhia pinus* Linn. nor *Sylvia pinus* Lath., and had never seen Vieillot's work, it does not seem that we have any right to infer that he meant to do anything beyond what he actually did,

and as the validity of *Sylvia pinus* Wilson is not affected by the earlier *Certhia pinus* Linn. nor by *Sylvia pinus* Lath., a mere reference of the former to the genus *Sylvia*, the Pine Warbler should revert to its old name of *pinus* and be known as *Dendroica pinus* (Wils.).—WITMER STONE, *Academy Natural Sciences, Philadelphia*.

Hooded Warbler (*Wilsonia citrina*) on Belle Isle, Detroit, Mich.

—On page 463 of 'The Auk,' for 1920 there is a note by Bradshaw H. Swales recording a Hooded Warbler (*Wilsonia citrina*) seen by him on Belle Isle, May 6, 1920.

Strange as it may seem I probably saw the same warbler on that date as my report to the Biological Survey will disclose. I saw the bird first about 8 A. M. and watched it for some time. It was in low bushes on the edge of a road bordering one of the canals. It would drop down to the ground, then up to the low bush again, constantly uttering its fine, high "chip" note and nervously flitting about in such a manner as to show the extensive white on the tail. Finally I walked on through the woods but when I returned to the same locality an hour or so later the bird, a lovely male in full plumage, was still in the immediate vicinity. I sat down and watched him again for some time and knew that there was no mistake in the identification as I had seen and studied many of this species while living in Indianapolis, Indiana, where the bird is fairly common.—ETTA S. WILSON, *Detroit, Mich.*

Some Records of Breeding Birds for the Vicinity of Washington, D. C.—During the many years of collecting oological material in the marshes along the Potomac River on the District of Columbia boundary line and vicinity, I have personally collected nests and eggs of the following species, which have never been recorded.

***Rallus virginianus*. VIRGINIA RAIL.**—While collecting with my son Edward E. Court, June 3, 1917, we found two nests of this species, containing 7 and 11 eggs respectively, in the marshes just back of Jackson City. The nests were built among the cat-tails about six inches above high water, and composed of reeds, lily stems and marsh grass. In both cases the eggs were heavily incubated, but made perfect specimens. There were other pairs nesting as we heard birds at several other places in the marsh.

The eggs were all uniform in color, a light cream-white, spotted mostly at the large ends, with reddish-brown and with faint markings of lavender.

The whole time we were in this part of the marsh the birds were within twenty feet of us.

***Rallus elegans*. KING RAIL.**—Reported by Dr. Chas. W. Richmond and Mr. S. S. Dickey, Pennsylvania, as nesting here. This season Mr. Ernest A. Sikken, Hyattsville, Maryland, and myself found a set of eleven eggs in the marshes back of Jackson City, Virginia. This set is in the Sikken collection. The eggs were incubated about five days. This is one of the rarest of the nesting species in this locality.

Gallinula galeata. FLORIDA GALLINULE.—We collected a set of seven eggs June 3, 1917, and one of eight May 30, 1919. Both sets were started in incubation about five days. The first nest was placed on the top of a large bunch of marsh grass, poorly constructed of lily stems and reeds. This set is very handsomely marked, and all the eggs are evenly spotted with pale buff and deep reddish-brown and chestnut.

The second set had a lighter back ground. Birds were not seen but were heard.

Botaurus lentiginosus. AMERICAN BITTERN.—On June 3, 1917 we found three nests of this species. The first had three young ready to fly, the second three young ten days old, while the third contained four hard set eggs which I took. This nest was a rather large platform of reeds about a foot above the water. The female flushed when I was within three feet of her.

Eggs shining brownish-drab.

Bubo virginianus virginianus. GREAT HORNED OWL.—A set of three eggs was taken by my friends Robert Bains and Rowland J. Booth. This is the first set ever taken in the District of Columbia. The bird had nested in a large sycamore tree on the edge of Rock Creek from which the female was flushed. Eggs three, incubation far advanced in early March, 1920. This set is in the collection of Mr. Rowland T. Booth, Silver Springs, Maryland.

Antrostomus carolinensis. CHUCK-WILL'S-WIDOW.—While collecting in St. Marys County, Maryland, May 10, I was fortunate to find a set of this species. This is the first set taken in this county. The two eggs were somewhat incubated and I have them in my collection. Just across the river in Northampton County, Virginia, they are rather plentiful and I have heard several calling at once and many times flushed birds going through the wilder country toward Smith Point light house.—Edw. J. COURT, Washington, D. C.

Sturnus vulgaris. EUROPEAN STARLING.—This species has made its way down here and in 1920 I found them nesting on April 20 on Bladgens Hills. Six pairs nested in a grove of maples and I secured a nest and five eggs. I also found them nesting in deserted nests of the Red-headed Woodpecker, *Melanerpes erythrocephalus*, at Brookland, D. C., and a small colony at College Park, Prince George County, Maryland.

Rare Records for Ann Arbor and the State of Michigan.

Tyto pratincola. BARN OWL.—This species is becoming more common each year. The first set of eggs taken in the state was given to the Museum of Zoology by the collector, Mr. Walter E. Hastings of South Lyon, Oakland County. The nest was found April 8, 1916, in an enlarged nest of the Flicker. It was built in an old maple tree about four miles northeast of South Lyon, and about forty feet from the ground.

Archibuteo lagopus sancti-johannis. ROUGH-LEGGED HAWK.—This migrant is rarely seen here, but one was taken at Portage Lake, about

sixteen miles northwest of Ann Arbor, on November 27, 1920, by Earl Haynes.

Picoides arcticus. ARCTIC THREE-TOED WOODPECKER.—This is a very rare straggler from the north of Michigan and we have only one previous authentic record for this vicinity, October 18, 1884 by M. L. Eaton. A fine male was taken November 7, 1920, near South Lyon, Oakland County, by Fred L. Giddings and given to the museum collection. On December 6 three others were seen by Walter Hastings, also of South Lyon.

Cryptoglaux acadica. SAW-WHET OWL.—On January 1, 1921 a fine immature male was taken in a small tamarack swamp near Pleasant Lake, Freedom Township. This species is a rare visitant here in winter, and we have but one breeding record. The above specimen was donated to the museum by the collector, Mr. E. J. Lohr.

Picoides americanus americanus. AMERICAN THREE-TOED WOODPECKER.—On January 12, 1921 the Museum received a skin of the female of this species, taken by B. R. Twombly in Gogebic County in December, 1920. This constitutes the second record for the state. The first was taken at Sault Ste. Marie on October 1, 1901; and was mounted for the high school collection of the city by Professor C. E. Richmond. It may prove to be a rare resident of the Upper Peninsula.

Astur atricapillus atricapillus. AMERICAN GOSHAWK.—A fine specimen of this rare winter visitant was noted at South Lyon on January 17, 1921 by Mr. Walter E. Hastings.—NORMAN A. WOOD, *Museum of Zoology, University of Michigan, Ann Arbor, Mich.*

The Song Periods of Individual Birds.—During spring and summer of 1920, I started a study of the songs of individual birds, believing that the great difference that exists between the songs of individuals of the same species could be used as a means of tracing the movements of the individuals. This study brought many interesting results, most of which are too incomplete to publish at present. But one result was so unexpected, and has so important a bearing on certain ornithological work being done today, that I believe it should be brought to the attention of others as soon as possible.

The Biological Survey for some time has been collecting data on the numbers of breeding birds in the country, basing counts on the numbers of singing males during the height of the breeding season. In this work it is assumed that during the early morning hours every male bird is in song. No one, so far as I know has ever questioned that this assumption is correct, and I believe that I was one of the first to make it and to use it. ('Auk' XXXI, pp. 200-210). My work this summer has shown me, however, that with a number of species, and perhaps with the great majority, it is not true.

A species such as the Field Sparrow, for example, sings continuously from its arrival in April till the early days of August. This summer, with

a large number of individual Field Sparrows under observation, each distinguished by its location, and by the peculiarities of its song, I did not find a single individual that sang throughout the song period of the species. A great many ceased singing in the latter part of May and were not singing at all in June, in the height of the breeding season. This same condition obtained with the Meadowlark, Vesper Sparrow, Towhee, Yellow-throat and Wood Thrush, among species I had selected for study. In fact there was only one species, the Song Sparrow, of those I studied, where individuals did sing throughout the song period of the species.

From May to August I visited a certain wood almost daily. I found no less than seven male Wood Thrushes residing in that wood, each with its own special preference as to locality, and each with certain peculiarities in the phrases of its song that distinguished it from the others. I studied each song carefully and made graphic records of the phrases of the songs, so that I came to know each bird quite well. During this entire time I never heard more than three thrushes in song in this wood on the same day, even early in the morning. Anyone attempting a count of birds in this area, basing his count on singing males, unless he studied individual songs, would have counted but three pairs of Wood Thrushes.

These facts, if they are true of birds throughout the country, will make the bird counts underestimates so far as certain species are concerned. I suppose there are some who will be skeptical as to my ability to distinguish individual birds by peculiarities in their songs. While I am not ready to go into the detailed proofs and explanations of this work now, I would suggest to the doubter, that if he possess a musical ear, he try it himself. I am convinced that there is much to be learned by a detailed study of bird songs, and more students in this field would be welcome.—ARETAS A. SAUNDERS, 48 Longview Ave., Fairfield, Conn.

Convergent Habits in Fur Seals and Penguins.—In reading Dr. G. Murray Levick's interesting book 'Antarctic Penguins,' I find it impossible to avoid frequent suggestions of parallelism in the habits of the Adelie Penguin and the Fur Seal. These may be of no particular significance but perhaps are of enough interest to be especially noted.

Like the seals, the penguins are amphibious, highly gregarious, and migratory. Unlike them, they are polygamous and this of course involves important differences in habits; but when these are taken into account, the resemblances are still numerous. As is well known, the Fur Seal comes to land only to breed during a short summer season, arriving after a long migration from its winter home in the open sea. The penguin does the same and, no less than the seal, follows its course with the precision of a mariner and his compass and arrives at its destination within a narrow time limit. The male seals precede the females and take up adjacent positions in their rookery and the females later come to them, the males fighting much with each other at this time. With penguins, the sexes arrive together, but unmated, and the female chooses a nesting spot and

clings to it until joined by a male which may be almost immediately or may be delayed for some days. The males fight violently for the possession of individual females and their melees often cause injury to eggs or young. With the seals the case is similar. With both seals and penguins, after domestic relations are well established, there begins a period of excursions to and from feeding areas at sea. During this period much time is spent in playing in the water directly in front of the rookery. The sheer joy shown by fur seals when they return to the water after an enforced stay on land is evidenced also by the penguins which are said to go through many of the same antics as the seals, shaking and rubbing themselves clean, rolling and tumbling about, chasing each other, "porpoising" in small schools and having a general good time. The game of "joy riding" on ice floes, which seems to be a favorite with the penguins, is not possible for the seals, but otherwise their "fun" is much the same. Like mother seals, the penguins remain away from the rookery several days, sometimes nearly a week, while on their fishing excursions. During the interval the temporarily orphaned young await their return collected in groups which may number 50 or more. The pup seals in such groups, or "pods," are left largely to their own devices, although the presence of many adult seals, which are always near them, guarantees them against serious danger. The same result is accomplished by the penguins, but in their case there is perhaps a more definite guardianship of the young by certain of the adults which remain with them. Dr. Levick's account of the way the food-laden, returning mother penguins are successively importuned by various hungry youngsters not their own, and the way these are scornfully repulsed until the rightful one is found, could be applied almost to the letter to the Fur Seal.

Possibly the most interesting parallel in the habits of the two animals is that relating to the enforced fasting. In the seals, this is largely confined to the males, which go without food for six to nine weeks. With the penguins, both sexes fast, but the female does so longer than the male, her minimum being about four weeks. In both cases, the fasting takes place while vital demands are at the peak during a time of great sexual and general physical activity.

Further resemblances, especially those of minor character, are numerous, but these need not be noted.—WILFRED H. OSGOOD, *Field Museum of Natural History, Chicago, Ill.*

A Bagworm Plague.—When I first came to Bowling Green, Kentucky, in 1908, the great knob now the site of the Western Kentucky State Normal School was covered except for a small space on the summit with a rank cedar thicket, once the rendezvous of bands of outlaws in the unsettled times following the Civil War. This knob and several similar cedar brakes had long been the nesting places of the Bronzed Grackle, the Robin, the Brown Thrasher, the Cardinal, and the Chewink. In winter hundreds of White-throated Sparrows, Golden-crowned Kinglets, and

Purple Finches found food and protection there. Twined about many of the hoary old cedars were rank growths of poison ivy, furnishing food for a host of birds. In the spring of 1912 I found in one day on this hill 75 nests of the Bronzed Grackle. Some trees had as many as ten of these large, bulky nests and literally "you could not hear your ears" when all the birds were talking or gossiping. On one of the snowiest days of the winter of 1916-1917 I found 24 species of birds on this hill in a little over an hour and in the height of the migrating season that spring I saw 52 species there in a single afternoon.

But all this has radically changed, making a bird lover sigh for "the good old days." The bagworms, which had been steadily growing more numerous for several years, took on plague proportions in the summer of 1917. The poorly-nourished trees fought along the best they could through the rest of that summer and until midsummer in 1918, when they began to die rapidly. The whole hill soon looked as if it had been burned over. No other visible enemy except the bagworms could be found and I feel sure that this was the real cause.

Naturally, the hordes of birds came back half-heartedly but it was not particularly attractive to them to place their nests in spots unprotected from the sun or from enemies below. However, a few Bronzed Grackles tried the experiment but scolded more even than usual and seemed thoroughly disgusted with one year's experience. The ground birds also found their secluded places suddenly opened up and sought other nesting-sites. I feel quite fortunate now if I can see anywhere on the knob half as many species as I could see before the death of the cedars. So far as I have been able to observe in the past two years there are not so many Bronzed Grackles or Chewinks in my territory, as a whole, as there were before this plague. Probably the breaking up of their old breeding grounds has made them seek other sections.—GORDON WILSON, *Bowling Green, Ky.*

An Anonymous Work of John Cassin.—Some years ago it was my privilege to read over the correspondence of Professor Spender F. Baird, at the home of his daughter, the late Lucy H. Baird in Philadelphia and copy such portions as I might desire. I was especially interested in the many letters from John Cassin describing his work at the Philadelphia Academy, and the general progress of ornithology in America.

Under date of March 12, 1851, he wrote "Stephens and I are very busy getting up a lot of the greatest nonsense you ever saw, a 'Comic Natural History of the Human Race.' I will send you the second number which will soon be out." He also adds that his contributions to this work are all signed "C."

Knowing that Cassin possessed a keen sense of humor and did not take his science so seriously as to preclude a glimpse at the more frivolous side of life, I have always been curious to see a copy of this work but none ever came to my attention until quite recently.

My friend, Dr. Spencer Trotter, in the course of conversation a few days ago, mentioned a curious book that had been entrusted to him for sale, and upon his showing it to me I at once realized that it was the long sought work of Cassin. It is entitled 'The Comic Natural History of the Human Race; designed and illustrated by Henry L. Stephens, Philadelphia, S. Robinson, No. 9 Sansom Street.' It is Royal, octavo, exactly the same size as Cassin's 'Birds of California and Texas,' and contains 216 pages. There are forty colored plates, drawn by Stephens and lithographed by L. Rosenthal, representing human heads on the bodies of various birds, mammals, fish, etc. Some of these are portraits of individuals, others simply of types. The humorous letter press is by nine named contributors and several anonymous ones. Cassin was the editor as well as the author of six of the sketches, although, without the clue given in the Baird letters, it would be impossible to connect him with the volume, as his name does not appear. To one familiar with his letters, however, his peculiarities of style and wording are at once apparent. Stephens was the artist of certain plates of the U. S. Exploring Expedition reports and probably of some of the Government surveys.

This curious volume has no ornithological interest except in connection with Cassin, but that seems to be sufficient excuse for placing on record the facts that I possess in relation to it.—WITMER STONE, *Academy of Natural Sciences, Philadelphia*.

Correction.—In recording the occurrence of the American Egret at Scarborough, Maine, ('Auk,' XXXVIII, p. 109, January, 1921) the date of capture was, through error, omitted. The specimen was shot July 18, 1920.—RUTHVEN DEANE, *Chicago, Ill.*

RECENT LITERATURE

Howard's 'Territory in Bird Life.'—Those who have read Mr. Howard's work on the British Warblers will recall the attention that he gave to the origin and development of various activities connected with reproduction, and the ingenious and suggestive theories and explanations that he presented in this connection. The present volume¹ carries out many of these theories on broader lines linking together various phases of sexual behavior, song and migration under the general impulse of reproduction.

Mr. Howard has produced an intensely interesting volume and while he does not pretend to have sifted the matter to the bottom and while we may think of many exceptions to some of his theories, he has nevertheless presented a mass of observations and clever explanation which will serve as food for thought and demand the careful attention of everyone interested in the study of bird behaviour.

Our author's investigations have led him to regard the establishment of a definite "territory" or domain by each breeding male, as the key note to the whole subject. First there is an organic change which stimulates the male to isolate himself from the flock, involving more or less of a migration; then there is the finding of an environment appropriate for purposes of reproduction, in which the male establishes himself, fighting off any rivals that come within his domain; and finally the arrival of a female with which he mates and together they defend their territory and accomplish the duties of reproduction. It follows, as the author admits, that upon his theory the discovery of a mate rests largely upon the female which reverses the accepted order or procedure. "But after all" he says "what reason is there to suppose that the male seeks the female or that a mutual search takes place; what reason to think that this part of the process is subject to no control except such as may be supposed by the laws of chance?"

The male, he goes on to show, cannot leave his "territory" without danger of its usurpation and as rapidity of mating is essential, some guidance to the female is necessary and here is where song comes in. Male birds rarely sing, especially with full vigor, until established in their "territory" and hence the fully developed song is always an advertisement of a male ready for mating. If singing began before the territory was selected the female would be attracted by a male not yet at the stage for mating, and reproduction would in such case be delayed. It of course not infrequently happens that two females are attracted by the same male and then follows a physical combat just as occurs between males

¹ *Territory in Bird Life.* By H. Elliot Howard, with Illustrations by G. E. Lodge and H. Grönvold. London, John Murray, Albemarle Street, W. 1920. Svo pp. i-xiii—1-308, 11 photogravure plates. Price 21 shillings net.

when they are establishing the boundaries of their respective "territories." Later on paired males will fight when one enters the "territory" of the other or one male and female will unite in the defence of their domain against a neighboring pair, or a male will drive out an encroaching female or vice versa. Only this theory of an established "territory" as the primary cause of conflict can, in the author's opinion, explain the complicated nature of the fighting that is to be seen every season and in every community. Furthermore neutral grounds may be recognized, unsuited perhaps for nesting, but rich in food supply, where various males as well as females will resort in perfect harmony, just as in the winter flockings, although the very same individuals will engage in strenuous combat if they encounter one another within the confines of their respective "territories." Within each "territory" there is a favorite perch from which the male sings and which Mr. Howard terms the "headquarters." This is the station which Mr. H. Mousley has so fully described as the "singing tree" in his paper in *'The Auk'* for 1919, p. 339—to which paper by the way our author makes no reference.

The delimitation of the "territory" is accomplished as a result of habit, in visiting certain particular spots or perches, over and over again, in search of food or for other purposes, and while fairly definite the boundaries are of course not absolute.

The need of a "territory," Mr. Howard thinks, lies in the necessity of the parents' securing sufficient food for their young without going so far from the nest as to deprive them of brooding for too long an interval, and he dwells particularly upon the extreme delicacy of young passerine birds and the need of continual protection from cold by brooding.

In other words each nest is by this plan provided with a sufficient food supply immediately around it, which would not be the case were there a community of nests close together. As birds of other species do nest close by and have "territories" of their own with different boundaries, we must naturally suppose that their food is of a different character. No doubt some of our economic ornithologists could furnish data of the greatest interest in this connection and demonstrate why certain species can live in close proximity without affecting each other's food supply.

There are of course species in which many pairs nest in close association. Many of these, as the Guillemots, Mr. Howard considers, represent cases where the question of securing food is subordinate to the question of securing a station suitable for reproduction. With the Guillemots the nearby ocean always provides an abundant food supply, but the narrow rock ledges have to be divided into the smallest possible "territories" to provide nesting space for all and maintain the existence of the species. The cases of community nesting as in swallows may be explained in somewhat the same way or may, as it certainly does in the case of Rooks, involve the factor of mutual protection.

While the "territory" theory is the dominant theme of Mr. Howard's book he has much to say on other topics more or less related to it. In

connection with song he emphasizes the absolute necessity for a "specific" character in the song of every individual of a given species if it is to serve as a guide to the female of that species in finding a mate. This is I think a statement with which all students of bird song will agree, for while the keen ear may be able to recognize a number of *individual* songs in any species, they all have the specific quality so developed that there is never a question as to what *species* is singing. We fail, however, to harmonize with this Mr. Howard's claim of mimicry in so many British birds as the Jay, Wood Owl, Red-backed Shrike, and various Warblers. Surely there is no such wide-spread mocking among American birds and we are led to wonder whether many cases of alleged mimicry are not mere fancied resemblances. If mimicry exists to such an extent it would seem to be a serious hindrance to the development of a specific song.

In Mr. Howard's discussion of migration he makes no mention of Dr. Watson's experiments with the Terns of the Dry Tortugas and in other connections seems to be quite unacquainted with the American literature bearing upon his subject. Americans however cannot afford to remain ignorant of Mr. Howard's interesting work—interesting alike to the student engaged in research along similar lines and to the general reader who appreciates a fascinating discussion of some of the deeper problems of ornithology.

The beautifully drawn plates represent spirited contests between individuals of various species of British birds, a phase of bird behaviour which takes on a great deal of interest in connection with Mr. Howard's theory and which seems to have been much neglected and but poorly understood in the past.—W. S.

Saunders' 'Distributional List of the Birds of Montana.'—In this admirable publication¹ Mr. Saunders presents us with the first comprehensive list of the birds of Montana and at once places the ornithology of the state on a firm foundation. His list is up to date in every respect, consisting of an introduction, a discussion of distributional areas in which life zones and forest associations and their characteristic birds are considered; a fully annotated list of 332 species (with additional lists of extinct, introduced and hypothetical species) and a bibliography.

In the introduction he apologizes for the fact that the present list cannot compare in completeness with those of most of the other western states because there are as yet scarcely any resident ornithologists in Montana, little collecting has been done, and there are almost no series of specimens, while for many sections scarcely any data are available. It may however

¹ A Distributional List of the Birds of Montana, with Notes on the Migration and Nesting of the Better Known Species. By Aretas A. Saunders. Pacific Coast Avifauna Number 14. Cooper Ornithological Club, Berkeley, California. Published by the Club, February 1, 1921. pp. 1-194 and 35 text figures. Price \$6.00, for sale by W. Lee Chambers, Business Manager, Eagle Rock, Los Angeles Co., California.

prove fortunate that an ornithologist of Mr. Saunders' ability has made a review of the subject at such a comparatively early date, as he has no doubt been able to settle many matters that would have been impossible of solution a few years later, while such an accurate work as this will prevent many an error by those who write upon the birds of the state in the future.

While Mr. Saunders has given us all that can be expected in a "distributional list" we regret that he did not have the opportunity to add biographies of at least some of the species which he lists, as the delightful paragraph which closes his introduction shows that he is quite capable of furnishing this much more difficult sort of ornithological contribution. He has evidently had experiences too, which his successors will hardly be privileged to enjoy in view of the rapid settlement of the state today. He says in speaking of the pleasure of living over in retrospect the experiences recorded in his notes: "I have seen again the rolling prairies on a bright June morning, with countless McCown Longspurs, rising into the air and parachuting down again into the grass, or a male Curlew, charging with loud protest toward the man who had ventured near his nest. I have seen the prairie ponds, dotted with ducks of many species, with pink and white Avosets wading about the muddy shores, and Coots and Grebes swimming among the tules that border the farther side. On the same prairies, bleak with the winter snow and cold I remember the whirling flocks of Snow Buntings, Horned Larks and Rosy Finches or a single Snowy Owl, sitting on a rise of ground, and flying silently away at my approach. The ever changing mountains have been pictured in my memory; the wonderful little Dipper, diving under a waterfall and emerging to sit on a wet stone and sing, the friendly Rocky Mountain Jays, who came at the noon hour to share my lunch in the pine forest, the cock Franklin Grouse, sitting in a dark green spruce top, opening and closing the red comb over his eye, the Solitaire rising in flight song above the mountain peaks, his voice ringing loudly and melodiously through the clear air; and the sweet evening chant of the White-crowned Sparrow in the willows near our camp by the lake shore. However scientifically "cut and dried" the text of this list may seem, back of it is a living Montana, teeming with interesting and wonderful bird life, worthy of greater attention from the future ornithologist."

Few states show such a diversity of physical conditions as Montana and the bird life varies accordingly from the Upper Sonoran and Transition prairie districts of the east to the Canadian, Hudsonian and Arctic Alpine mountain districts of the western counties. Already Mr. Saunders has found it difficult to accurately locate records of the older publications dealing with Montana birds, so rapidly are names changing as settlement advances and new towns and counties are created. Many of these would doubtless have entirely lost their significance had he not placed them while it was still possible to do so.

The illustrations consist of an outline map of the state and a number of half-tones of scenery, birds and nests from photographs of Mr. A. D. DuBois and the author, some of these having appeared previously in 'The Auk,' although the fact is not mentioned.

The author is to be congratulated in sticking to the nomenclature of the 'A. O. U. Check-List,' except in some emendations to common names. The insertion of every proposed innovation in nomenclature in a work of this kind serves no purpose but to confuse the reader and detract from the value of the publication.

Both the author and the Cooper Club are to be congratulated upon the appearance of this notable addition to the well known series of which it forms a part.—W. S.

Hartert on the Types in the Tring Museum.—In November, 1918, Dr. Ernst Hartert published a list of the types of birds in the Brehm Collection in the Tring Museum, which was followed in 1919 by the first instalment of a catalogue of the types in the general collection, covering the Corvidae to the Meliphagidae. The second instalment¹ is now before us carrying the list from the Nectariniidae through the Troglodytidae.

Some idea of the size and importance of the Tring Collection may be gathered from the fact that this list, so far, includes no less than 878 types. Most of the types are of species described by Lord Rothschild and Dr. Hartert although there are a number of other authors. In the course of his work Dr. Hartert has had occasion to name several new forms which appear in this list for the first time: *Cinnyris alinae vulcanorum* (p. 426) Kivu, Urwald; *C. souimanga apolis* (p. 428) Madagascar; *Zosterops intermedia periplecta* (p. 434) Lombok; *Pelicius zeylonus phanus* (p. 451) Farta Bay, W. Africa; *Prinia mistacea graueri* (p. 457) near Baraka, Africa; *Sylvietta leucophrys chloronota* (p. 460) Baraka, Africa; *Cisticola tinniens perpalla* (p. 466) Benguela; *Turdus obsoletus parambanus* (p. 475) Paramba, Ecuador; *T. fumigatus caparo* (p. 475) Trinidad; *Cyornis banyumas peromissa* (p. 491) Selayar, south of Celebes; *Rhipidura rufiventris tiandu* (p. 497) Taam Island, Tiandu Group.—W.S.

Gurney's 'Early Annals of Ornithology.'—In this volume² Mr. Gurney has collected a mass of data concerning the earliest published accounts of birds, with exact quotations from the texts and reproductions of a number of the most interesting drawings. Beginning with the pre-historic bird pictures in the Spanish caves he traces the development of

¹ Types of Birds in the Tring Museum. By Ernst Hartert, Ph.D. B. Types in the General Collection. (Continued from *Novitates Zoologicae*, 1919, p. 178.) (*Novitates Zoologicae* XXVII, pp. 425-505. November, 1920.)

² Early Annals of Ornithology. By J. H. Gurney, F. Z. S., Author of "The Gannet, A Bird with a History," "A Catalogue of the Birds of Prey, *Accipitres* and *Striges*," etc., with illustrations from photographs and old prints. H. F. & G. Witherby, 326 High Holborn, London, 1921. 8 vo. pp. 1-240. 12 shillings, 6 pence net.

ornithology century by century down to the time of Linnaeus, Pennant and Latham.

Prior to the tenth century we have only scattered mention of birds in old Saxon verses, where the Gannet, Kite, Goshawk and Raven appear. For several centuries however the birds most frequently mentioned in literature were the domestic fowl and other birds used for food, and rapacious species employed in falconry, which practice is said to have dated back to 1700 B. C. in Persia and even earlier in China. Pheasant hunting is mentioned in the Welsh laws of the tenth century, and in the fifteenth century laws were passed to check the ravages of Rooks. The Venetian ambassador in 1496 was astonished at the abundance of bird life in England and reports that one or two thousand tame swans could be seen at once on the Thames. Swan laws and the marking of the bills of swans to denote ownership come in for much attention a little later.

In the sixteenth century there is an interesting housekeeping record of birds brought to Hunstanton Hall, Norfolk and several early price lists of birds, show at what a ridiculously low cost they could be purchased. A swan in the fourteenth century brought four shillings, a snipe a penny, while four larks could be had for the same price, and a teal for two pence.

Details of the great feast, when Neville the Chancellor of England was made Archbishop of York indicate what a place birds played in the menu of the fifteenth century. The program called for 4,000 Mallard and Teal, 2,000 Geese, 400 Swan, 400 Plover, 104 Peacocks, etc., sixteen species of birds being enumerated.

In the sixteenth and seventeenth centuries we find the first writers who could be considered "ornithologists," while the first list of English birds is that of Christopher Merrett, 1666, a poor effort at best, which was followed in 1676 by the famous 'Ornithologia' of Willughby and Ray.

Space will not permit a more detailed review of Mr. Gurney's book but to those who are interested in early bird lore and in tracing the origin of domestic fowl and the former status in England of many birds now rare, will find a perusal of his pages intensely interesting. A good index serves as a clue to the voluminous and diverse information which the book contains.—W. S.

Swarth's 'Birds of the Papago Saguaro.'—This National Monument lying just east of Phoenix, Arizona, is a tract of land set aside for the conservation of the peculiar desert vegetation of the region, which is so rapidly disappearing before the advance of cultivation. Connected with it by the Apache trail are the Tonto National Monument and the Roosevelt Bird Reservation some eighty miles farther east. The purpose of the present pamphlet,¹ gotten out by the National Park service, is to present

¹ Birds of the Papago Saguaro National Monument and the Neighboring Region Arizona. By H. S. Swarth. Washington, Government Printing Office. 1920 pp. 1-63 [with eight plates from photographs of birds and habitats.] Dept. of the Interior National Park Service.

some reliable information regarding the birds of the region; and in choosing Mr. Swarth to prepare the account a wise selection was made, as no one has a better knowledge of Arizona bird life.

An interesting sketch of the physical features of the region with the characteristic birds and plants is presented, followed by a fuller description of the more important birds, their recognition marks, character of occurrence and habits. These sketches cover the Palmer's Thrasher, Cactus Wren, Verdin, Western Kingbird, Dwarf Cowbird, Desert Sparrow, Phainopepla, Zone-tailed Hawk, Texas Nighthawk, Arizona Crested Flycatcher, Desert Quail, White-winged Dove, Mearns' Gilded Flicker, Gila Woodpecker, Farallon Cormorant, Pallid Great Blue Heron and Black-crowned Night Heron.

Lists are added of birds seen during a short visit to the region in 1917: thirty species on the Papago Saguaro Monument, May 30-June 4; thirty-seven at Tempe and surrounding farm lands during the same period—eighteen being identical; fifty-two at Roosevelt Lake, June 5-11 and July 2-5; fifty-seven in the Sierra Ancha, June 11-July 2 and twenty-six at Globe, July 5-7.

Mr. Swarth's pamphlet will be of great value to anyone visiting the region and forms an important contribution to the ornithology of Arizona, as well as a record of the present status of the bird life of the region for future comparison.—W. S.

Economic Value of the Starling in the United States.—This report¹ is primarily a consideration of the food of the Starling based upon an examination of 2157 stomachs of the birds collected mainly in Connecticut, New Jersey and New York and upon field investigations carried on by the authors. The results of these studies show that the food of the Starling consists largely of injurious insects and that its food habits are either beneficial or neutral so far as man is concerned, the time during which it destroys crops or molests other birds being extremely short compared with the endless hours spent in searching for insects or feeding on wild fruits.

In the opinion of the authors the Starling is a more valuable bird than the Robin or Flicker and compares favorably with the House Wren. They think that while no legislation should prevent farmers or others from killing Starlings, when actually engaged in destroying crops, the bird should on other occasions be protected by law. They admit that the great abundance and notably gregarious habits of the bird may develop some minor food habit to such a degree that it may become serious, while the roosts often become a nuisance in towns or villages. Judging by our own experience we are inclined to think that the Starling can take care of

¹ Economic Value of the Starling in the United States. By E. R. Kalmbach and I. N. Gabrielson, Assistant Biologists, U. S. Department of Agriculture, Bulletin No. 868. January 10, 1921. pp. 1-66. Four plates and several diagrams.

itself without protective legislation, and that it might be as well to leave it in that category, as it is now in most of the states where it occurs. Then in case of any undesirable development in its habits, its numbers could be checked without waiting for the repeal of a law. The bird is not now shot for any purpose and is so wary that it is difficult to approach near enough to shoot it in any numbers.

The historical account of the introduction and spread of the Starling given by the authors of this report is not so accurate as that given in Mr. Forbush's report of 1915—a publication by the way which is not mentioned, although Mr. Forbush's investigations were carried on in part under the auspices of the Biological Survey. The Starling as a matter of fact was established at Trevoise Pa. by 1904; at Philadelphia by 1905 and at Cape May, N. J., by 1910; all duly published records, the last of which would have made some change in the authors' chart on page 5 had they looked it up. The great roost too at Doylestown, Pa., described in 'The Auk' for 1917, pp. 338-340 is not mentioned.

In the earlier reports of the Biological Survey authorities and references were always given for statements and data quoted from others, either published or manuscript, and other reports on the same subject mentioned, but this practice has for some reason been discontinued in later years. This is not only very annoying to those who would like to trace such authority but is contrary to the custom of scientific publications and the best of the economic works, such as 'The Game Birds of California,' Forbush's reports, etc. The excuse of lack of space which might be made in the case of Government publications is hardly a valid one as the matter could easily be arranged so as to allow for quotation of authorities. In the present report, for instance, this information would be of far greater value than the long columns of technical names of insects upon which the Starling feeds which mean nothing to anyone but an entomologist, the more important ones having already been mentioned along with their English names in the text. These remarks on methods of publication however in no way reflect upon the conscientious work to Messrs. Kalmbach and Gabrielson and the unprejudiced attitude in which they have handled the rather difficult problem of the Starling's economic status. An excellent color plate from a painting by the senior author forms a frontispiece to the report.—W. S.

Mathews' 'The Birds of Australia.'—The last two parts of Mr. Mathews' work continue the treatment of the Muscicapidae, the former bringing to a close the eighth volume—the first of the Passeriformes, including two pages of corrections to the "Check-List" which is to be bound up with Volume VIII.

¹ The Birds of Australia. By Gregory M. Mathews, Volume VIII. Part 5. December 15, 1920. Volume IX, Part 1. February 15, 1921. H. F. and G. Witherby, 326 High Holborn, W. C. I. London.

As new names proposed in this part we notice three races of *Levinornis rufiventris* and two of *Eopsaltria griseogularis* as well as a new genus *Peneanthe* (p. 273) for *E. leucura*.

In the preface the author further explains his views on the importance of anatomical characters in classification, emphasising the importance of a full knowledge of the subject but stating that "insignificant items have been given great degree and the higher classification based on variable anatomical details of little import." After all, the relative importance of anatomical and superficial characters seems to be a matter of personal opinion. Mr. Mathews objects to our use of the word "sure" in the statement "we find just as much divergence in external characters among species which we feel sure must be closely allied"; but he immediately follows with the statement that in "a group—* * * * * whose evolution as to superficialities is *known* [*italics ours*] their morphology should be contrasted and the degree of anatomical variation determined." But if we claim to *know* how external characters have developed why may we not be *sure* of anatomical relationships? We are however heartily in accord with Mr. Mathews in his reliance upon external characters in conjunction with morphological features in improving our classification and our criticism was due really to a lack of clarity in his former statements regarding the matter.

The first part of Vol. IX covers the old genera *Rhipidura* and *Myiagra*. *Setosura setosa davidi* (p. 31) appears as a new name for *S. s. macgillivrayi*, preoccupied; while *Leucocura leucophrys carteri* (p. 41) is described as new. It is not always clear whom Mr. Mathews is naming his new forms after, as he rarely tells us. An appendix to one of his lists containing information would be valuable historically.—W. S.

Van Oort's 'Birds of Holland'.—A double part (7-8) of this important work¹ consists entirely of plates (61-80) of ducks, the text to which will be issued in Part 9. These plates are excellent in execution and are of especial interest to American ornithologists since the Blue-winged Teal, Pintail, Shoveller, European Widgeon, Goldeneye, Old-squaw, Greater Scaup and the Scoters are among the species depicted. All sexual and seasonal plumages are shown especially the eclipse plumage and the downy young which makes this a work of reference of the greatest importance. We do not recall another work in which the plumages are so fully illustrated. W. S.

Wetmore on Cave Birds of Porto Rico.—Among the mammal remains recently obtained and reported upon by H. E. Anthony from the

¹ Ornithologia Neerlandica. De Vogels van Nederland door Dr. E. D. Van Oort, directeur van 's Rijks Museum van Natuurlijke Historie te Leiden. Met ongeveer vierhonderd gekleurde platen. Martinus Nijhoff. Afslevering 7-8.

² Five New Species of Birds from Cave Deposits in Porto Rico. By Alexander Wetmore. Proc. Biol. Soc. Washington 33, pp. 77-82. December 30, 1920.

caves of Porto Rico are some bird bones which are being studied by Dr. Alexander Wetmore and pending the completion of his report he has published descriptions of five new species—*Polyborus latebrosus* (p. 77); *Gallinago anthonyi* (p. 78); *Oreopeleia larva* (p. 79); *Tyto cavatica* (p. 80); and *Corvus pumilis* (p. 81).—W. S.

Recent Papers by Oberholser.—In a paper on new forms of *Cyornis*¹ Dr. H. C. Oberholser describes a new subspecies of *C. rubeculoides*, two of *C. banyumas* and two of *C. elegans*, while his ninth instalment of nomenclatural changes² comprise *Dendrocitta celadina* (p. 83) a new name for *D. sinensis* (Lath.); *Motacilla rhadinura* (p. 83) for *M. longicauda* Rupp.; *Eremomela griseoflava perimacha* (p. 84) for *E. flaviventris* (Burchell); *Turdoides polioplocamus* (p. 84) for *Crateropus griseus* (Gm.) and *Arrenga glaucina* (Temm.) for *A. cyanea* all being preoccupied.—W. S.

Todd on New South American Birds.—Mr. W. E. C. Todd proposes in this paper³ sixteen new forms from various parts of South America and Mexico. While some of these are adequately described there are seven in which the diagnosis consists of only two or three lines, including the trinomial name of the form with which the new one is compared. Such descriptions will in all probability prove a hindrance to any comprehensive treatment of the groups to which they belong, until Mr. Todd presents adequate descriptions or until the types are borrowed. One diagnosis reads simply "similar [to an already described form] but general coloration obviously darker and blacker" nothing further except the data of the type.

We have commented upon this sort of practice before and feel, with a large number of other ornithologists, very strongly on the subject. We fear it is useless to hope for that millenium when systematic writers will join hands in an effort to advance the science in which they work in every way possible, instead of retarding its progress by publishing these careless and slovenly diagnoses. Meanwhile why does not the Carnegie Museum take some steps to provide means of publication so that the valuable collections which it is constantly securing might be promptly and adequately described?—W. S.

Chapman on New Birds from South America.—The American Museum of Natural History has recently established a new publication under the title of "Novitates" for the immediate publication of new species, etc. The second number is devoted to the presentation of descriptions of eight new South American birds by Dr. Frank M. Chapman. As usual his descriptions are full and satisfactory and in marked contrast

¹ Descriptions of Five New Species of *Cyornis*. By Harry C. Oberholser. Proc. Biol. Soc. Washington. 33, pp. 85-88. December 30, 1920.

² Mutanda Ornithologica. IX. *Ibid.* pp. 83-84.

³ Descriptions of Apparently New South American Birds. By W. E. Clyde Todd. Proc. Biol. Soc. Washington. 33, pp. 71-76. December 30, 1920.

to certain others that we have been compelled to comment upon. Full comparisons are made with the closely allied forms and not infrequently all of the races of a species are reviewed and discussed in connection with the proposed new race.¹

The new forms described are as follows: *Capito brunneipectus* (p. 1) Rio Tapajoz, Brazil; *Nonnula amaurocephala* (p. 2) Rio Solimoes, Brazil; *Rhopochares cochabambae* (p. 2) Cochabamba, Bolivia; *Microhoppas emiliae* (p. 3) Rio Xingu, Brazil; *Drymophila devillei subochraceus* (p. 4) Rio Curua, Brazil; *Hypocnemis hypoxantha ochraceiventris* (p. 5) Rio Xingu, Brazil; *Siptornis punensis cuchacanchae* (p. 5) Cuchacancha, Bolivia; *Cistothorus platensis caracasensis* (p. 6) Caracas, Venezuela.

Five of these new forms are described from a collection submitted for study by Dr. E. Snethlage of the Museu Goeldi at Para, while the others are from the American Museum collection.—W. S.

Bangs and Penard on Some American Birds.—This paper² consists of a collection of miscellaneous notes dealing mainly with neotropical birds. *Crotophaga sulcirostris pallidula* (p. 365) is proposed for birds of the isolated colony at Cape St. Lucas; *Muscifur* (p. 376) is proposed for *Myiarchus semirufus* Scl. & Salv.; *Allenia apicalis* is changed to *A. fusca* on grounds of priority; the races of *Dendroplex picus*, *Myiozetetes cayanensis*, *Tyrannus melancholicus*, *Pachyrhamphus polychopterus* and *P. marginatus* are reviewed with the result that the following are described as new: *D. p. bahiae* (p. 369) E. Brazil; *M. c. harterti* (p. 374) Panama; *P. m. nanus* (p. 395) E. Peru. A further study of the Lafresnaye types discloses the fact that the type of *Lophotriccus spiciferum* is really a specimen of *Colaptes auratus* which necessitates the changing of the name of the latter species to *Lophotriccus galeatus* while the former, for which there is neither a generic nor specific name available, is renamed *Cometornis vitiosus* (p. 373).—W. S.

Hellmayr on the Birds of Southeastern Peru.—This paper³ is based upon collections made by H. and C. Watkins in the Sierra de Carabaya, province of Puno, Peru, numbering some 250 species and 1200 specimens. It is in the form of an annotated list with very full discussion of the characters of the forms and such questions of relationship and nomenclature as have arisen in connection with them. A few new forms have already been described from the collections in the 'Proceedings' of the Bavarian Ornithological Society 1912–1914 and the following appear in the present paper: *Ramphocelus carbo centralis* (p. 26) Agua Suja, Brazil; *Spizitornis parulus patagonicus* (p. 51) Neuquen, Argentina; *Lepidocolaptes lacrymiger carabayae* (p. 81) Sierra de Carabaya, Peru.

¹ Descriptions of Apparently New Birds from Bolivia, Brazil, and Venezuela. By Frank M. Chapman. American Museum Novitates. No. 2. pp. 1–8. January 31, 1921.

² Notes on Some American Birds, Chiefly Neotropical. By Outram Bangs and Thomas E. Penard. Bull. Mus. Comp. Zool., LXIV, No. 4, pp. 365–397. January, 1921.

³ Ein Beitrag zur Ornithologie von Südost-Peru. Von C. E. Hellmayr. Archiv. für Naturg. 85. Heft. 10. November, 1920. pp. 1–131. [In German.]

Among other interesting nomenclatural points to which attention is called in this valuable paper is the fact that by Gray's designation the type of the genus *Picolaptes* is a species of *Xiphorhynchus* and the name falls into the synonymy of the latter genus while *Thripobrotus* a substitute name takes the same course leaving *Lepidocolaptes* Reich. as the proper name for this group. In this paper Dr. Hellmayr has made another valuable contribution to systematic Neotropical ornithology.—W. S.

Kuroda on New Japanese Birds.—In the last volume of the 'Dobutsugaku Zasshi' (XXXII, pp. 243-248 (1920)), Mr. Nagamichi Kuroda describes three new forms of Japanese birds as follows: *Milvus lineatus formosanus* (p. 243) Central Formosa; *Nyroca ferina ferinoides* (p. 243) Nameda, near Tokyo; *Campephaga lugubris asakurai* (p. 244) Central Formosa. The descriptions are given in both Japanese and English.—W. S.

Gurney on Norfolk Ornithology.—Mr. John Henry Gurney has recently published a bibliography¹ of his ornithological writings covering the period from 1866 to 1918 and dealing mainly with the birds of Norfolk, and also a list of references to the annual 'Ornithological Reports for the County of Norfolk' which he has prepared for the years 1879 to 1918. There are few local records of this kind covering so long a period of years. In this country the record of the Delaware Valley Ornithological Club appearing each year in 'Cassinia' has now covered twenty years and is perhaps the longest record of the sort in America. As president of the Norfolk and Norwich Naturalists' Society Mr. Gurney has recently delivered as his annual address² on the ornithologists of Norfolk and their work which has been published in the 'Transactions' of the society.—W. S.

Bulletin of the Essex County Ornithological Club.—Another of the excellent publications³ of this active organization is before us which fully maintains the high standard of its predecessor. Besides the many local notes and the account of the annual Ipswich River trip there are several articles of general interest. Mr. R. A. Nichols has an account of variation on the song of the Whip-poor-will. He presents much original observation and comment on the observations of others, and speaks of the difficulty of making a syllabic representation of bird song that will be satisfactory to another person. This has often occurred to us and we are inclined to think that the trouble is that, in many of the common syllabic representations, the attempt has been made to use actual words of the

¹ Articles on Ornithology and Ornithological Reports for the County of Norfolk. By J. H. G., 1918, pp. 1-8.

² Presidential Address. By J. H. Gurney, F. Z. S. Reprinted from the Proc. Norfolk and Norwich Naturalists' Society, 1919-1920, Vol. XI, Part 1, pp. 1-22.

³ Bulletin of the Essex County Ornithological Club. December, 1920, pp. 1-54. Price, 50 cents.

English language instead of trying to represent the sound by letters without any reference to the words they may or may not form. Thus "whip-poor-will" is less satisfactory than "whip-poo-weel" as Mr. Nichols says, while his "whip-oor-eel" as the song of a particular bird that he studied exactly denotes the call of one to which we have listened. Mr. C. J. Maynard has a paper on his original discovery of the Ipswich Sparrow which has much historic value and in this connection we might call attention to Alexander Wilson's figure of the bird as the "male" of the Savannah Sparrow long before Mr. Maynard took his specimen (cf. *Osprey* II. p. 117.).

A paper on the nesting, song and play of the Tree and Barn Swallows by Dr. C. W. Townsend contains a mass of interesting observations on the habits of birds that have been far too much neglected. Mr. A. P. Stubbs has an instructive discussion of the white gulls of Swampscott. Five perfectly distinguishable gulls of pure white or nearly white plumage were recognizable among the Herring and Black-backed Gulls, and after fourteen seasons' study of them it was finally decided that they represented different plumages of only two species—the Glaucous and Iceland Gulls. Just such studies as this are needed to aid in the identification of gulls in the field, as the several plumages of a single species are quite as different to the observer as those of several different species, and they must all be learned before accurate identifications can be made.

Mr. A. B. Fowler takes exception to part of the comment on the sight record of the Connecticut Warbler on the Ipswich River trip of 1919, which appeared in the review in 'The Auk', considering that Mr. Brewster's remarks on the rarity of the species made thirteen years ago have little weight today. The point was that *alleged* occurrences of the bird were as numerous at that time as today, while actually proven cases of its occurrences in spring in the east are just as rare now as then. The main intent of the criticism, however, was that there was no clear evidence that the observers realized that they were making a most unusual record for all of eastern North America as well as for the Ipswich River. It is of course entirely a matter of opinion as to the desirability of publishing such records which are of the greatest importance if correct but which can never be proven and hence are useless for any generalizations.—W. S.

Bulletin of the Illinois Audubon Society.—This attractively gotten up publication¹ contains much of interest concerning the conservation of nature in general and the activities of the society. Much space is devoted to the problem of the preservation of our National Parks and we are reminded again of the action of the last Congress in granting to a Federal Water Power Commission the authority to lease all public waters including those in National Parks and Monuments and of appli-

¹ The Audubon Bulletin. Fall, 1920. Published by The Illinois Audubon Society. pp. 1-48.

cations that have already been made for establishing dams and power houses in the Grand Canyon and the Sequoia National Parks. Unless this privilege, so far as it affects parks, is revoked by Congress, there is no knowing what it may lead to. The preservation of many birds is dependent upon the preservation of the forests and the latter upon keeping the National Parks inviolate.—W. S.

Annual Report of the Chief of the Biological Survey.—Only those who read this report¹ carefully will have any idea of the extent and diversity of the work that the Survey is now carrying on. Under economic work in mammals we find that no less than 21,558 Coyotes were killed during the past year and in addition some 4000 other predatory animals. The practical extermination of the Prairie Dog over a great part of Cochise and Graham Counties, Arizona, has also been effected and nineteen million acres in the west have been subjected to poison treatment for the extermination of rodents. The tremendous result of poisoning may be realized when we learn that 1000 rabbits were killed for each ounce of strychnine used in Gooding County, Idaho. It seems certain that by means of poison the extermination of many species of mammals, if desired, is only a matter of time, and we trust that all possible indirect results of this tremendous overthrow of nature's balance may be carefully taken into consideration before the final result is attained.

Under economic ornithology we learn that investigations of the Survey have proven the Meadowlarks seriously injurious to sprouting oats and corn in South Carolina and the Secretary of Agriculture has authorized their killing from November, 1919 to April, 1920. Similar permission to kill Robins in the cherry growing districts of New York has been granted from June 1 to July 15, as well as the killing of Grebes, Loons, Terns, Gulls, Mergansers, Bitterns, Green, Great Blue, Little Blue and Black-crowned Night Herons, at fish hatcheries, and of Mergansers by state wardens along any of the streams of Michigan where they prove destructive to trout.

Charges against the Dove in South Carolina, Geese in eastern Maryland and Thick-billed Parrots in Arizona have not been substantiated, while the claim that birds were being poisoned in the western states by the operations against vermin were found to be greatly exaggerated, the birds killed being "not enough to cause alarm."

The work of the Bird Banding Association, as already reported, has been taken over by the Survey and the study of the economic value of various birds and investigations on their distribution and migration have been continued.

Under the head of bird reservations the disastrous effect of shutting off the water supply of the Klamath and Malheur Lake reservations is referred to and unless this action can be checked the reservations seem

¹ Report of Chief of Bureau of Biological Survey. Annual Report Department of Agriculture pp. 1-36 (covering fiscal year ending June 30, 1920.)

doomed. It is deplorable that some cooperation of the different departments of the Federal Government cannot be arranged to prevent such a disaster as is here imminent. In the case of the migratory bird law there is splendid cooperation all along the line from both Government and independent organizations and the results are too well known to require further comment. But where water power or water privileges are involved both bird reservations and National Parks seem to be in the greatest danger.—W. S.

Crandall on the Eclipse Plumage in the Domestic Fowl.—Mr. Crandall describes the eclipse plumage of the Red Jungle Fowl as exhibited in birds in the New York Zoological Gardens obtained from the Philippines and also a similar plumage in a domestic Black-bellied Red Game Cock and suggests that the lack of records of this phase of plumage in the domestic fowl is probably due rather to carelessness of observation than to its absence.—W. S.

Economic Ornithology in Recent Entomological Publications.—The U. S. Bureau of Entomology in several recent bulletins has included information on bird enemies. These enemies and the insects affected are noted in the following paragraphs:

Spotted Apple-tree Borer (*Saperda cretata*).—This beetle does not seem to be near so serious a pest as its congener the round-headed apple-tree borer. Its operations result in unthriftiness of the tree attacked and sometimes the death of limbs. Fred E. Brooks, author of the bulletin¹ relating to it says: "By far the most effective natural check to the increase of this borer seems to be the woodpeckers. The borers feed in positions easily accessible to these birds and empty burrows are to be found on almost every infested tree, with the marks of the birds around the wounds giving unmistakable evidence of the cause of the borer's disappearance. During the present studies every attempt to rear larvae in unprotected trees met with a loss of all the individuals as a result of woodpecker attack. The species of bird responsible for the loss of the borers was not determined definitely, but all the evidence pointed to the downy woodpecker, *Dryobates pubescens medianus*. It seems probable that the spotted apple-tree borer would be a much more widely known and destructive pest were it not for the constant depletion of their numbers by woodpeckers."

Clover Stem-borer (*Languria mozardi*).—In southwestern irrigated regions this beetle has recently become a pest of considerable importance to alfalfa culture. The head and thorax of this beetle are deep red in color, and the remainder of the body bluish black. Thus it is a typical example of a warningly colored insect and moreover belongs to a family supposed to be distasteful. However, V. L. Wildermuth and F. H. Gates

¹ Eclipse Plumage in Domestic Fowl. By Lee S. Crandall. Zoologica, II, 15. No. 11. October 1920.

² Bul. 886, U. S. Dept. Agr., Oct., 1920, pp. 8-9.

who have prepared a treatise upon it say¹: "The clover stem-borer, like many of our older native species, is in a great majority of cases kept in check by its natural enemies." Hymenopterous parasites, toads and birds are recorded as feeding upon the clover stem-borer, the birds being Traill's flycatcher, starling, meadowlark, mockingbird Carolina wren and robin. .

Beet Leaf-beetle (*Monoxia puncticollis*).—This is a native species that has transferred its attentions from its natural food plants to sugar beets and in some instances has caused serious damage. This is another of the so-called protected insects of the supposedly nasty phytophagous group and is buff and black or warningly colored. Nevertheless it "has a goodly number of natural enemies" among which are ladybird beetles a stink-bug, parasites, toads and birds. "The Bureau of Biological Survey² has found specimens of the beet leaf-beetle in the stomachs of the starling (*Sturnus vulgaris*) and prairie chicken (*Tympanuchus americanus*) and of other species of the genus *Monoxia* in the stomachs of the northern and Wilson's phalaropes (*Lobipes lobatus* and *Steganopus tricolor*), least flycatcher (*Empidonax minimus*), English and vesper sparrows (*Passer domesticus* and *Pooecetes gramineus*), violet-green swallow (*Tachycineta thalassina*), and pipit (*Anthus rubescens*)."

Western Cabbage Flea-beetle (*Phyllotreta pusilla*).—This agile little beetle when abundant destroys young cabbage plants, but it does not restrict its attentions to cabbage, attacking also beans, peas, beets, mustard, kale and rape. It seems to have few natural enemies, but the authors state³ that the Biological Survey has found the species "in the stomachs of three species of birds and other beetles of the same genus in the stomachs of 12 kinds of birds." Birds thus would appear to be the most important natural enemies of this pest.

Grape-vine Flea-beetle (*Alica chalybea*).—This is one of the best known and most widely distributed enemies of the grape and has caused severe injuries in restricted localities. A few natural enemies are recorded⁴ among which are 8 species of birds: the bobwhite, meadowlark, Cape May warbler, the red-eyed, white-eyed and Philadelphia vireos, the Carolina wren and bluebird.

Clover-leaf Weevil (*Hypera punctata*).—This beetle, one of the important clover pests was accidentally introduced from Europe. It is of interest that some of the data relating to its spread in this country was obtained by examination of birds stomachs: the first specimen reported from Michigan was found in the stomach of a crow. The authors of a recent bulletin upon the pest state that birds are a valuable and import-

¹ Bul. 889, U. S. Dept. Agr., Oct., 1920, p. 19.

² Chittenden, F. H. and Marsh, H. O., Bul. 892, U. S. Dept. Agr., Oct., 1920, p. 18.

³ Chittenden, F. H. and Marsh, H. O., Bul. 902, U. S. Dept. Agr., Oct., 1920, p. 14.

⁴ Isely, Dwight. Bul. 901, U. S. Dept. Agr. Dec. 1920, pp. 22-23.

ant check on the insect and that it is known to be eaten by 25 species. This list has been increased to 42 of which the crow, crow blackbird and starling are the most effective.—W. L. M.

Economic status of the Kingfisher and Rook in Great Britain.—

Dr. Walter E. Collinge's latest publications in economic ornithology deal with these two species. The paper on the Kingfisher is the detailed report of which an advance summary has previously¹ been reviewed.

"A summary of the percentages of the various food items shows that 77.4 per cent of the food is of a neutral nature, 15.66 per cent is beneficial, and only 7.28 per cent is injurious." The bird is considered useful rather than otherwise in relation to trout streams.

Respecting the Rook, Dr. Collinge finds² that the species has increased in recent years, with probably some change in feeding habits so that it is doing more harm than good. Its economic tendencies are rated as: injurious 52 per cent, beneficial, 28.5 per cent, and neutral, 19.5 per cent. Repressive measures are recommended in the hope that reduced to normal numbers the species will again prove a help rather than a hindrance to agriculture.—W. L. M.

The Ornithological Journals.

Bird-Lore. XXII, No. 6. November–December, 1920.

A Partridge Don Quixote. By H. H. Cleaves.—An account of a tame Ruffed Grouse with illustrations from life.

Why do Birds Bathe. By E. T. Seton.—Discusses sun baths, dust baths, showers and plunges, and their practice by different groups of birds. As this is a topic about which comparatively little has been written attention might be called to Mr. Howard Scudder's paper in 'The Auk' for 1915, p. 455, which treats the subject from a slightly different angle.

The Migration and plumages of N. A. birds covers the Cowbirds with a plate by Fuertes.

Dr. A. A. Allen discusses nests with a key to those of eastern birds.

The Boat-Blind in the Snow. By G. A. Bailey. Excellent photographs of winter birds.

Bird-Lore. XXIII, No. 1. January–February, 1921.

The twenty-first Christmas census takes up the entire number except for 'The Season' and the editorial and Audubon Society departments. There are 134 lists of which those for Montauk Point, N. Y., and Cape May, N. J., with thirty-eight species each, are the largest for the Northern

¹ 'The Auk' Vol. 37, No. 3, July, 1920, p. 484.

² On the Economic status of the Kingfisher, *Alcedo ispida* Linn. *The Ibis*, Jan., 1921, pp. 139–150.

³ The Rook: its relation to the Farmer, Fruit Grower and Forester. *Journ. Ministry Agr.*, Vol. 27, No. 9, Dec. 1920, reprint 8 pp.

and Middle states. We notice that the Broad-winged Hawk appears again in a Pennsylvania list, a very unlikely occurrence.

Dr. A. A. Allen has an excellent article in the school department on the flight of birds.

The Condor. XXII, No. 6. November-December, 1920.

The Wing Claw in Swifts. By Alexander Wetmore.—Decides that it is not of taxonomic value but is generally present and is probably an archaic character of no present use.

Nesting of the Olive-sided Flycatcher in Berkeley, Calif. By Jos. Dixon.

The Condor. XXIII, No. 1. January-February, 1921.

Acorn Storing by the California Woodpecker. By William E. Ritter.—A valuable study of this much neglected subject. The evidence indicates that the grubs that develop in the acorns are the chief object in storing them, although the meat of sound acorns is also eaten by the birds, after the supply of grub-infested ones is exhausted. It also seems clear that the holes are made solely for the purpose of storing acorns and are often made sometime in advance of the ripening of the crop. There is no evidence that they were originally made in the course of digging for boring larvae but rather that the habit developed from an original process of sticking the acorns in natural holes or crevices in the bark, which is still sometimes done. An additional argument in favor of this theory which the author does not mention is that the Red-headed Woodpecker, of the east, has this habit occasionally developed although it has never advanced to the stage of digging special holes or attempting to store acorns on a large scale. Prof. Ritter finds also that the instinct of the birds occasionally goes wrong and they store pebbles by mistake, while they make many holes that are never used and he considers that the habit is at bottom a rather generalized one which accounts for the maladaptations which are exhibited.

Suggestions Regarding the Systema Avium. By R. C. McGregor.—We are glad to see Mr. McGregor's views on what he considers an ideal 'Systema Avium' though the opinion of each one of us will differ materially. It is however Utopian to expect to reach the ideal at one stroke. The proposal of the B. O. U. which was accepted by the A. O. U. was for a series of regional lists, which should agree in nomenclature in all cases where they overlap, and if this can be accomplished a great step will have been made toward Mr. McGregor's ideal. Even the preparation of a Nearctic and a Palaearctic volume with uniform nomenclature will be a great accomplishment. The two most serious features in the whole problem Mr. McGregor fails even to mention i. e., (1) How shall we finance the publication of such a work as he suggests? and (2) Where shall we find a "small committee" of men with the time and ability to do the work properly? We however welcome heartily his remarks on two other matters, (1) his willingness to follow an official list and sink his personal opinions.

Only by such action can uniformity in nomenclature be attained and the frequent ignoring of our standard lists today only retards our work and limits the usefulness of the papers by authors who follow such practices. (2) The inclusion in the list of all subspecies not absolutely proven worthless, to be weeded out later as our knowledge increases. It is a waste of time for any committee to try to settle, off-hand, all such cases as these.

A Hunter's Notes on Doves in the Rio Grande Valley. By Aldo Leopold.

Concerning the Status of the Supposed Two Races of the Long-billed Curlew. By Joseph Grinnell.—Seems to pretty thoroughly dispose of the alleged differences.

Notes on Some Specimens in the Ornithological Collection of the California Academy of Sciences. By Joseph Mailliard.

The Oologist. XXXVII, No. 12. December 1, 1920.

Watching a Hummingbird Feed her Young. By R. A. Sell.

El Hornero. II, No. 2. December, 1920. [In Spanish.]

The Ostriches of the Argentine Republic. By R. Dabbene.—A synopsis of the species of *Rhea* and *Pterocnemis* found in the Argentine.

The Birds of the Chaco. By Enrique L. Arribalzaga.

Notes on the Shorebirds of North America which Winter in the Argentine Republic. By R. Dabbene.

The Ibis. (XI Series.) III, No. 1. January, 1921.

On a Recently Described Woodpecker (*Picus rubricollis*) from Siam. By E. C. Stuart Baker.—With a colored plate.

Notes on the Birds of Northeast Chihli, in North China. By J. D. D. La Touche. Part III.—Nos. 182–307, apparently completing the list.

On Some Western Australian Birds collected between the Northwest Cape and Albany (950 miles apart.) By Thomas Carter. With nomenclature and remarks by G. M. Mathews. (Continued.)

Remarks on Rare and otherwise Interesting Birds contained in Collections made by Mr. G. L. Bates in Southern Cameroon. By D. A. Bannerman.

On the genus *Macrosphenus* Cassin, with special reference to the races of *Macrosphenus flavicans*. By D. A. Bannerman.

A Note on the Breeding Birds of Crete. By Col. R. Meinertzhagen.

On the Economic Status of the Kingfisher, *Alcedo isipida*. By W. E. Collinge.—Found to feed on quantities of insect larvae injurious to fish spawn and very young fish. The injurious elements in its food far outnumber the beneficial, and protection for the bird is strongly advocated. Further examination of the food of our own Kingfisher might be well worth while, though it is doubtless far more injurious to fish than its little trans-Atlantic relative.

Bulletin of the British Ornithologists' Club. No. CCLIII. November 9, 1920.

Forty new forms of birds are described from East and West Africa, India and other parts of Asia, and Crete.

Bulletin of the British Ornithologists' Club. No. CCLIV. November 30, 1920.

Six new forms from Africa and the Malay region are described.

In the discussion on the increased cost of printing the 'Bulletin' the suggestion was made that the length of the descriptions of new forms could be shortened considerably, which seems to us a very unfortunate possibility as it would be better not to publish new forms at all, until it is possible to publish them properly.

Mr. Mathews has two new genera *Proseisura* (p. 35) for *Arses lorealis* and *Nesoceryx* (p. 35) for *Charadrius bicinctus*. The editor calls attention to the fact that *Siphia obscura* Sharpe supposed to be from Borneo is really *Basileuterus rivularis*.

Mr. J. L. Bonhote made an address on Bird Protection, treating the matter impartially and with great fairness. He points out that sentiment is the most powerful element in securing the protection of any animal, and if well developed is all sufficient. Apathy and ignorance on the part of the general public are the cause of lack of sentiment and are the most serious obstacles to making protective laws effective. Sentiment on the other hand is a dangerous hindrance to the operation of a law for the decrease of a species proven to be noxious. Mr. Bonhote seems to us to underestimate the value of birds as insect destroyers, though we grant that excessive protection may make a bird so numerous that its injurious qualities outrank its beneficial ones, although the opposite may have been the case before it became so plentiful—as for example the Thrushes in England and the Robin in certain parts of America. In connection with collecting of birds or eggs he points out that the critical period of a bird's life with regard to the perpetuation of the species is the breeding season and the collecting of eggs, which affects directly the breeding season, is more serious than the collecting of skins. Collecting of eggs as he also points out comes especially into prominence, from the fact that the rarer a bird is the greater are its eggs prized.

A few years ago the Kite in England was reduced to nine birds and it was necessary to provide absolute protection by law as well as barbed wire protection, two keepers and several watch dogs to save from the egg collectors, the three nests that were built. The same absolute disregard by collectors in this country for the preservation of a species on the very verge of extinction is seen in the case of the California Condor, the Raven, etc., where the possession of the eggs by collectors seems to be paramount to every other consideration.

Bulletin of the British Ornithologists' Club. CCLV. December 24, 1920.

Six new forms from Africa and India are described.

Bulletin of the British Ornithologists' Club. CCLVI. January 27, 1921.

Seven new birds from Africa and Asia are described as well as a new snipe, *Coenocorypha aucklandicae iredalei* (p. 63), from New Zealand, by Lord Rothschild.

British Birds. XIV, No. 7. December 1, 1920.

Some Notes on the Ruff. By Miss E. L. Turner.—An exceedingly interesting paper illustrated by photographs of Ruffs fighting.

Notes on the Nestling-Downs of the British Hawks. By H. F. Witherby. A valuable contribution to the study of molts and plumages. The author finds three distinct sets of down in these birds; (1) a fairly short and not very thick down, which is present when the bird is hatched; (2) short tufts of white down growing here and there amongst the former; and (3) a thick woolly, usually gray, down, which covers 1 and replaces 2 and grows in many places where no down grew before. It is in turn superseded by the plumulae or under down feathers of the regular plumage, but it is not, as considered by Mr. C. Ingram, identical with them.

The Food of the Peregrine Falcon. By J. F. Peters.—A remarkable list of birds upon which it preys.

British Birds. XIV, No. 8. January 1, 1921.

Notes on the Breeding of the Leaser Kestrel. By F. N. Chasen.

Further Notes on the Nesting of the Storm-Petrel. By Audrey Gordon

A Contribution to Swan History. By N. F. Ticehurst.—The keeping and marking of Swans dates back to a very early period of English history and has resulted in curious "swan laws" and "rights." Mr. Ticehurst has traced these back and presents a diagram of a "swan mark" used by Sir Richard de Totesham about 1370—perhaps the earliest "bird-band" on record!

British Birds. XIV, No. 9. February, 1921.

The Avocet at Home. By E. L. Turner. With interesting photographic illustrations.

The Avicultural Magazine. XI, No. 12. December, 1920.

A Control Board for the Export of Australian Animals.—Presents details of the laws now in effect.

The Avicultural Magazine. XII, No. 1. January, 1921.

Diet for Rearing Young Birds. By M. Amsler.

The Emu. XX, Part. 3. January, 1921.

This number is almost entirely devoted to the ornithology of Western Australia in connection with the holding of the annual congress of the R. A. O. U. in this territory for the first time. The completion of the transcontinental railway has made such a trip as this possible, and Americans who have not considered the matter carefully, may be interested to know that the distance from coast to coast is approximately the same in Australia as it is in the United States, while some of those who participated in the trip travelled at least half as far again. When we learn that 31 of the eastern Australian ornithologists made the trip we are forced to admit that their enthusiasm is far greater than that of the mem-

bers of the A. O. U. as judged by the attendance of easterners at San Francisco or of westerners at the eastern meetings, but it might be interesting to know what the railroad fares might be in the southern continent!

The train was stopped in the great interior desert where opportunity was given to see some of the strange birds and wild flowers, while during the whole journey the nomenclature committee kept steadily at work. The report of this committee is very encouraging and the new list will go far toward the uniformity of nomenclature for which we are all striving.

Besides the reports of the meeting and the results of the field trips made in connection with it, there is a valuable account of the birds of the Swan River district by W. B. Alexander and of those of Dirk Hartog Island by F. Lawson Whitlock.

The Austral Avian Record. IV, No. 4-5. December 16, 1920.

A Name List of the Birds of Australia. By G. M. Mathews and Tom Iredale. (Completed)—With annotations.

Forgotten Bird Artists and an Old-time Ornithologist. By G. M. Mathews and Tom Iredale.—An interesting review of the Watling drawings and suggestion that certain other drawings sometimes attributed to him were by Gen. Davies who was evidently an ornithologist of considerable attainments.

Snipe and Sandpipers. By G. M. Mathews and T. Iredale.—Some further suggestions on their classification.

The South Australian Ornithologist. V, Part 4. October 1, 1920.

The Birds of Kuitpo Forest. By S. A. White.

Revue Francaise d'Ornithologie. XII, No. 139. November 7, 1920. [In French.]

On the nesting of *Aquila fasciata*. By M. Mourgue and J. L. Hermitte.

Revue Francaise d'Ornithologie. XIII, No. 141. January. 1921.

By-Laws for the proposed French Ornithological Society.

Study of a Collection of Birds from Equatorial Africa. By J. Berlioz.

L'Oiseau. I, No. 8. August, 1920. [In French.]

Breeding of the Nightingale in captivity. By N. Mayer.

L'Oiseau. I, No. 9. September, 1920.

The Gang-gang Cockatoo. By J. Delacour. With colored plates (continued).

Experiences of a Naturalist in French West Africa. By Mr. Millet-Horsin. (Continued.)

Experiments in Masculinity. By A. Pezard.—Male Pheasants with female characters etc. (Continued.)

Hybrid between the Mikado and Elliot's Pheasants. By P. Crepin.

Ardea. IX, No. 2. September, 1920. [In Dutch.]

Biographical sketches of J. Buttikofer; and J. Ritzema Boz; who died during the year, and also an account of the life of Temmink by W. H. de Beaufort with two portraits.

Ornithologische Beobachter. XVIII, No. 3. December, 1920. [In French and German.]

Ornithological Notes from the Region of the Bosphorus. By A. Mathey-Dupraz. (Continued.)

The issues for October, November and January are devoted mainly to local notes.

Danske-Fugle. 1920. No. 1. [In Danish.]

Contains an article on the food of the Stork (*Ciconia alba*) by P. Skovgaard, with detailed list of insects, etc., and a list of the birds banded by the Danish Ornithological Society.

Danske-Fugle. 1920. No. 2.

Contains a detailed account of the food habits of the Short-eared Owl (*Otus vulgaris*).

Proceedings of the Ornithological Society of Bavaria. XIV, No. 4. December, 1920. [In German.]

Miscellanea Ornithologica. By C. E. Hellmayr. Contains a number of nomenclatural changes and a record of *Vermivora leucobronchialis* in W. Venezuela.

A New Woodpecker from Sumatra. By E. Stressemann. *Dryobates canicapillus volzi* (p. 288) and a new name *Picus myrmecophoneus* (p. 289) proposed by the same for *Picus striolatus* Blyth.

Ornithologische Monatsberichte. 28. No. 11-12. November-December, 1920. [In German.]

Our Knowledge of the Geographic Forms of *Alseonax murinus*. By H. Grote.—*A. m. subtilis* (p. 114) is described as new from Beni, central Africa.

Falco. For 1917. [In German.]

Contains a number of new names for varieties of European birds proposed in the author's peculiar way. What status his work will have in systematic ornithology may be open to question.

Tori. II, No. 10. December, 1920. [In Japanese.]

A List of the Birds of Dagelet Islands, Corea, with Detailed References to Some Species, By N. Kuroda and T. Mori.—Five new forms are described as follows: *Dryobates leucotos takahashii*, *Parus major dageletensis*, *P. varius saisiuensis*, *P. v. ulsorioensis*, and *Chloris sinica clarki*. There is an English translation of the descriptions of the new forms and a colored plate of the races of *Parus varius*.

Ornithological Notes from the Neighborhood of Sasanami, Prov. Nagato. By Y. Kanetsune.

On the Breeding Seasons of Some Birds in Prov. of Miyagi. By S. Kumagai.

Notes on the Breeding Habits of *Ninox scutulata* (Raffl). By M. Kawaguchi and H. Ikemura.

Ornithological Articles in Other Journals.

Middleton, J. C. Birds and How to attract them about our Homes. (Canadian Field Naturalist, May, 1920.)

Townsend, Chas. W. Notes on the Summer Birds of the Gaspé Peninsula (continued) (*Ibid.*)

Mousley, H. The Diving Habit and Community Spirit of the Spotted Sandpiper. (*Ibid.*)—In addition to the publications cited by Mr. Mousley we might add L. L. Jewel, 'Auk,' 1915, p. 227.

Lewis, Harrison F. Among the Coffin Carriers. (*Ibid.* September, 1920).—Being an account of the Great Black-backed Gull.

Williams, M. Y. Notes on the Fauna of the Moose River and the Mattagami and Abitibi County Territories. (*Ibid.* October, 1920.) A list of the birds observed.

Lewis, Harrison F. Change in the Status of Certain Birds in the Vicinity of Quebec. (*Ibid.*)

Blackwood, G. C. Notes on the Breeding Habits of the Dotterel in Scotland. (Scottish Naturalist, Nov.-Dec., 1920.)

Brock, S. E. Bird Associations in Scotland (continued). (*Ibid.* Jan.-Feb., 1920).—An ecological study.

Ridgway, R. Diagnoses of Some New Genera of Birds. (Smithsonian Misc. Coll. 7, No. 4. December 6, 1920.)—*Oroaetus* (p. 1) for *Falco isidori* Des Murs; *Phaeoetus* (p. 2) for *F. limnaetus* Horsf.; *Morphnarcus* (p. 2) for *Leucopternis princeps* Selater; *Percnohierax* (p. 2) for *Falco leucorhous* Ouoy and Gaim.; *Hapalocrex* (p. 3) for *Rallus flaviventris* Bodd. and *Limnocrex* (p. 3) for *Porzana cinereiceps* Lawrence.

Gabrielson, Ira N. The Birds of Marshall Co., Iowa. (Proc. Iowa Acad. Sci. XXVI, pp. 47-75.) A continuation of a paper in the preceding volume, carrying the list to 201 species with five hypothetical.

Burkitt, J. P. The Relation of Song to the Nesting of Birds. (Irish Naturalist, January, 1921.)

Foster, N. H. Birds' Songs at Hillsborough, Co. Down. (*Ibid.* February, 1921.)—Supplements the preceding.

Swales, B. H. Rare Birds in the Vicinity of Washington, D. C. (Proc. Biol. Soc. Wash. XXXIII p. 181.)

Wetmore, Alexander. The Soft Parts of the Anhinga. (*Ibid.*)

Osgood, W. H. The Turkey as a Subject for Experiment. (Amer. Naturalist, January-February, 1921.)—Calls attention to the known origin of the domestic bird and the definite subspecies of the wild one, as well as the fact that the former has retained its subspecific characters through long domestication. Altogether the bird forms an excellent subject for genetic experiment, far better than most of those used, the origin of which is hopelessly obscured.

McAtee, W. L. The "One-Letter" Rule for Generic Names in Zoology. (The Amer. Naturalist January-February, 1921.)—The writer,

after calling attention to the failure of the various codes of nomenclature to cover the question of what constitutes a "different" name, finds fault with certain authors for following the A. O. U. Code, which is the only one that attempts to present a definite ruling. The criticism is entirely destructive so far as we can see, and no solution is offered. The results of the A. O. U. rulings may not be consistent, it is true, but questions of this sort have to be settled arbitrarily and inconsistency is bound to result. The wisest way would probably be to "let sleeping dogs lie" in such cases, and not propose new substitute names until we have some arbitrary board which will say "these names are the same, these are different." No rule can be framed that will do the work automatically. If the other extreme to the one Mr. McAtee criticises were to be followed as thoroughly, there would be just as many undesirable changes.

Hildge, R. The Channel-bill or Rain-bird. (Queensland Naturalist, II, p. 106.)

Owen, J. H. The Sparrowhawk. (Nature, CVI, p. 695.)—A life history with excellent illustrations from photographs of this British bird.

Hankin, E. H. The Problem of Soaring Flight. (Proc. Cambridge Philos. Soc. XX, p. 219.)

Hesse, Erich. On the Name *Columba pallida* Latham. (Mittl. Zool. Mus. Berlin, 8, p. 311.) [In German.]

Olsen, A. Madagassisk Bird Names. (Nyt. Magazin for Naturvid. 58, p. 65.) [In Finnish.]

DeQuiros, Jose L. Ornithological Excursion to Janda [Spain]. (Biol. R. Soc. Espan. Hist. Nat., XX, No. 7, p. 236.) [In Spanish.]

Berkmann, M. A comparison of the Birds of eastern and western Hanover. (Jarsb. Naturh. Gesell. Hannover, IV, pp. 48-82.) [In German.]

Anon. The Crossing of the North and South African Ostriches. The Success of the Experiment. (Jour. Dept. of Agric. Union of S. Africa. Nov. 1920, p. 737.)

Doderlein, L. [A "Leitmotiv" in Animals.] (Die Astersden der Siboga Expedition. II Gattung *Lindia*, p. 194.)—Suggests a "Leitmotiv" in every well defined and properly understood group of animals, which may or may not be of systematic importance. The wonderful development of plumes in male Paradise birds is cited as an example of such a "Leitmotiv," these plumes developing on the head, breast, back or tail as the case may be, but always present somewhere. [In German.]

Woods, Frederick A. A Random Test in the Theory of Protective Coloration. (Jour. of Heredity, XI, No. 6.)

Landmann, A. Critical Investigation into the Fixing of Genotypes in Lesson's "Manuel d'Ornithologie" 1828. (Archiv. für Naturgeschichte, LXXXV, abt. A., Heft 4.) [In German.]

Additional Publications Received.—**Hollister, N.** Report of the Superintendent of the National Zoological Park for the Fiscal Year ending June 30, 1920.

Burnett, W. L., and Maxon, Asa C. Feeding Habits and Food of the Ring-necked Pheasant. (Circular 31, Colo. Agr. College.)

Sherman, Althea R. Bird Conservation. (Iowa Conservation, July-September, 1920.)

Witherby, H. F. A Practical Handbook of British Birds. Part X.

Bulletin of the American Game Protective Association. X, No. 1, January, 1921.

Bulletin of the Charleston Museum. XVI, Nos. 6-7, 8; XVII, Nos. 1-2, October, 1920-February, 1921.

California Fish and Game. VII, No. 1, January, 1921.

Canadian Naturalist, The. XXXIV, No. 8, November, 1920.

Fins, Feathers and Fur. No. 24, December, 1920.

Le Gerfaut. X, No. 4, 1920.

Natural History. XX, Nos. 4 and 5, September-October, and November-December, 1920.

Oologist, The. XXXVIII, No. 3, March, 1921.

Science. LIII, Nos. 1358-1369, January 7 to March 25, 1921.

West Chester (Pa.) Bird Club Bulletin. 1919-1920.

CORRESPONDENCE.

A Letter of J. P. Giraud, Jr.

EDITOR OF 'THE AUK':

I am sending you a copy of a letter which I know you will find of much interest. In 1867, Mr. J. P. Giraud, Jr., presented his collection of North American birds to Vassar College, Poughkeepsie. The letter is written to my father-in-law, a Trustee of the College at that time. I include also a copy of a letter from Mathew Vassar, founder of the college, to Mr. Lossing in which Mr. Vassar recounts his first meeting with Giraud. This letter was not dated. The bracketed words did not appear in the original but seem necessary for proper construction.

Yours very sincerely,

FRANK EDGAR JOHNSON.

16 Amackassin Terrace, Yonkers, N. Y.

Poughkeepsie, April 22, 1867

Benson J. Lossing, Esqr.

DEAR SIR:

Your pleasant note of yesterday came to hand late in the afternoon.

Local associations with collection are chiefly named in the "Birds of Long Island" printed if rightly remembering 1834 [1844] a copy of which will go with the Birds, if to be obtained. There doubtless [I] have spoken of my then fondness for gunning, especially Bay shooting. Yet fond as [I] then was of that amusement still [I] desired to know something more than merely name of that shot.

Hence [I] commenced forming [a] cabinet beginning with the Large Yellow Shank Snipe, Great Bittern and Herring Gull, and of the pleasant hours of my life none have passed more pleasantly than when collecting and studying those collected, and none have been more instructive.

None but those who have thoroughly studied Natural History are aware of its far-reaching embrace, learning, as it were, by absorption in directions of which the student is not directly in pursuit.

Students of Natural History must necessarily be close observers, which may be serviceable when apart from [the] cabinet. It is very generally regarded—so believing—that by naturalists, at least, acquaintance with any branch of Natural Science is an intellectual accomplishment, quite equal to music, drawing and other accomplishments [which] much pains are taken to acquire.

Naturalists by some are apt to be regarded sceptical on the subject of revealed religion, and [I] am happy to say that none such has ever been known personally to myself, and when enthusiasts would reach beyond

the province of Natural History they are frowned upon by the true adherents of Natural Science.

The collection by friends as well as by self is regarded valuable for containing a number of rare species from which Mr. Audubon made drawings for his large copper-plate edition "Birds of America" published as you are aware some years ago in London. Among the number of rare birds from Mr. Audubon is embraced the Great Auk, which is regarded by high authority, extinct. It also contains,—which may be interesting to some,—the first European Green-winged Teal and the first European Widgeon to which attention was called as having been shot in North America.

It further embraces also the original specimens of species new to Fauna of North America, which were described and figured in [a] folio, copy of which is to accompany the birds—only fifty copies of which were printed and distributed among the prominent Institutions in the United States and Europe devoted to Natural History, and a few leading Ornithologists.

Fifteen to twenty years ago it was—so believing—the most complete collection of North American birds extant since which period intercourse with the western side of the continent has been by collectors so frequent that many new species have been discovered scarcely sustaining Mr. Audubon* in his view with expression when completing Library edition of "The Birds of North America," which expression was, "I will give one hundred dollars for each and every new bird to be found in North America—it may have been United States—during my life."

Many of those since procured we have and are now in course of being mounted by Mr. J. G. Bell, the far-famed Taxidermist who mounted all in Vassar College Cabinet of North American birds.

With species now having and for species wanting—which Mr. Bell must have many through whom (I) hope that by Christmas next "Vassar College Cabinet of North American Birds" will be equal to any collection of North American birds in the world.

Yours Very Respectfully,

J. P. GIRAUD, JR.

* Prince delineator of Natural History.

Wednesday Morning

MY DEAR MR. LOSSING:

Yesterday for the first time in my life I had the pleasure of being made acquainted with our Fellow Citizen, J. P. Giraud, Jr., the ornithologist and generous donor of a valuable collection of Birds to "Vassar College," and I must say I was highly gratified with my friend, he was sociable, intelligent, and communicative

Yours truly,

M. VASSAR

NOTES AND NEWS.

THE next annual meeting of the American Ornithologists' Union will convene in Philadelphia, the week of November 14, 1921. It is important that all members should make a note of the date at once so that preparations may be made to be present. If the matter is ignored until after the summer vacation the time is all too short and many find themselves unable to make arrangements for the trip.

There are hundreds of members who have never attended a meeting and who therefore do not know what they have missed. Why not make this meeting a memorable one in point of attendance? An A. O. U. meeting is always an inspiration and the greater the attendance the greater is the mutual benefit.

An innovation planned for this year is to have the program issued in advance, but this, while of the greatest benefit to all, can only be accomplished by prompt action on the part of those who have communications to make. Many already have papers in view and they will facilitate the arrangements if they will inform the Secretary, Dr. T. S. Palmer, 1939 Biltmore Street, Washington, D. C., of the titles of their papers and the length of time necessary for delivery, at the earliest possible moment. No paper should require more than forty-five minutes for delivery and as much less as possible; furthermore an actual test should be made so that the speaker may be sure to finish within the allotted time.

The committee of arrangements appointed by the President consists of George Spencer Morris, William L. Baily, and George H. Stuart, 3rd, together with the Secretary and President of the A. O. U. ex-officio. An additional local committee representing the Ornithological Section of the Academy of Natural Sciences of Philadelphia and the Delaware Valley Ornithological Club has also been appointed to coöperate with the above, including: J. Fletcher Street, Dr. Spencer Trotter, James A. G. Rehn, Dr. William E. Hughes, Wharton Huber, and Samuel Scoville, Jr. Further details of the arrangements will appear in later issues of 'The Auk'; the thing to do now is to make arrangements to be present in November.

STEWARDESON BROWN, an Associate of the American Ornithologists' Union since 1895, died at his residence in Germantown, Philadelphia, on March 14, 1921, in the fifty-fourth year of his age. Mr. Brown, who was unmarried, was born in Germantown on April 29, 1867, the son of the late Amos P. Brown and Frances Brown, and one of a family of nine. One of his brothers was the late Amos P. Brown, Jr., well known as a geologist and mineralogist, who held the chair of Geology in the University of Pennsylvania.

Stewardson Brown was educated in the Germantown Academy and was employed for some years in the offices of the Lehigh Valley Railroad.

His main interest had, however, always been in natural history, and in 1891 he joined the Academy of Natural Sciences of Philadelphia, where he at once became active in the botanical department, and in 1900 accepted an assistant curatorship, in charge of the herbarium, which he retained until the time of his death. He was largely responsible for the organization of the Philadelphia Botanical Club, which he served for many years as Secretary, and later as President, being also editor of the Club's journal, "*Bartonia*." He was lecturer on botany on the staff of the Ludwick Institute and was Professor of Botany in the Pennsylvania Horticultural Society, member of the Torrey Botanical Club, the Botanical Society of America, and the American Association for the Advancement of Science. He was author of '*The Alpine Flora of the Canadian Rockies*' and (in association with Ida A. Kellar) of '*A Handbook of the Flora of Philadelphia and Vicinity*,' as well as of several minor publications. Mr. Brown's interest in ornithology was only second to that in botany. From 1883 to 1889 he was closely associated with the writer in keeping a record of the migration of birds at Germantown for the U. S. Department of Agriculture and in making a local collection of bird skins. He joined the Delaware Valley Ornithological Club in 1891 and was prominent in all of its activities, serving as Treasurer, Vice President and President. Mr. Brown carried on an extended study of the flora of the Middle States and also made trips in the interests of the Academy's herbarium to British Columbia, the Florida Keys, Bermuda, Jamaica, Porto Rico and Venezuela. While these expeditions were mainly devoted to botany he never failed to bring back much valuable ornithological data as well. He was always deeply interested in horticulture and during the last years of his life, when impaired health made field work impossible, he derived great pleasure from this pursuit and in the study of the birds which came to his garden.

Mr. Brown was associated with many activities in Germantown, where his entire life had been spent, and was a vestryman of St. Luke's Episcopal Church. He was of an exceptionally cheerful and generous disposition and made close friends of all who came in contact with him.—
WITMER STONE.

JOHN BURROUGHS died on March 29, near Kingsville, Ohio, on the train on which he was returning home from California, where he had been ill for the past six weeks. While not a technical ornithologist and at no time, we believe, a member of the American Ornithologists' Union, Mr. Burroughs held a prominent place in the development of American ornithology. His field was rather the interpretation of nature and his name is naturally associated with those of Thoreau and Bradford Torrey. Mr. Burroughs combined remarkable powers of observation with absolute accuracy and his writings possessed a charm that required no exaggeration or spectacular effort to heighten their power. It would be

impossible to estimate the number of persons who have been drawn, through his works, to an appreciation of nature and to enter the field of ornithology which would otherwise have remained closed to them.

John Burroughs was born at Roxbury, New York, close to the Catskill Mountains, on April 3, 1837, where he developed his love for nature, but showed no early evidence of the literary ability. In 1863 he went to Washington, D. C., and for some years filled a clerical position in the Treasury Department of the Government. It was at this time that he wrote his first book, 'Wake Robin.'

Later, in 1878, he established himself in a rural home on the Hudson River, just above Poughkeepsie, where most of his life was spent—either in the house itself or the little cabin "Slabsides," which he constructed in the woods not far away, where many of his admirers have visited him. Mr. Burroughs was a friend of Walt Whitman, Theodore Roosevelt, and John Muir, and with the last he collaborated in 'A Study of Our National Parks.'

Some of his other more important writings are 'Winter Sunshine,' 'Locusts and Wild Honey,' 'Fresh Fields,' 'Indoor Studies,' 'Birds and Poets,' 'Signs and Seasons,' 'The Light of Day,' 'Literary Values,' and 'Ways of Nature.'—W. S.

DR. ROBERT CUSHMAN MURPHY, formerly of the Brooklyn Museum, has been appointed Associate Curator of Marine Birds in the American Museum of Natural History, and will devote himself to a study of the rich collections of Neotropical and Subantarctic water birds which the Museum possesses.

MR. WHARTON HUBER, who spent the greater part of last year collecting in New Mexico in the interests of the Museum of Comparative Zoology, has been appointed Assistant Curator of Birds in the Museum of the Academy of Natural Sciences of Philadelphia.

MR. ALFRED M. BAILEY, formerly of the Museum at New Orleans, and later connected with the U. S. Biological Survey, has been appointed Curator of Birds at the Denver Museum and is about to leave for a trip to Alaska in the interests of the Museum.

PAUL KOLLIBAY, a well known Ornithologist of Neisse, Germany, died in November, 1919. He had a notable collection of birds and made extensive exchanges with museums and collectors in all parts of the world.

COMPLETE SETS OF 'THE AUK.'—Since the publication of the list of complete sets of 'The Auk' in the number for April, 1920, pp. 348-352, several sets have been transferred, a few have been completed, and others have been reported. As a result of these changes the number of complete sets now known has been increased from 154 to 175. Only nine of the additions are in public libraries and the number of those in the West and

South has been increased by three in California, and one each in South Carolina, Florida and Oklahoma, while Canada has gained two. The volumes missing in the sets in the libraries of Adelbert College, Cleveland and Columbia University, New York, have been supplied and these sets are now complete. Four transfers have been reported, including the Brewster set now in the library of the Charleston Museum, the Henshaw set transferred from Washington, D. C., to Norman, Okla., where it is now in the library of Mrs. M. M. Nice; the Osgood set now in the possession of H. B. Conover, Chicago; and the H. H. Bailey set erroneously credited to the Public Library at Newport News, Va., which has been moved to Miami, Fla. During the past year two owners of sets, Walter Faxon and John H. Flanagan, have died.

The additions to the list are as follows:

CALIFORNIA

Emerson, W. O., Haywards (one volume incomplete) Ingersoll, A. M., San Diego.
Hoffman, Ralph, Carpinteria.

DISTRICT OF COLUMBIA

Smith, H. M., Washington.

ILLINOIS

Field Museum, Chicago. University of Chicago.

MARYLAND

Jackson, R. W., Cambridge.

MASSACHUSETTS

Mass. Audubon Society, Boston. Kennard, F. H., Newton Centre.
Estate of Walter Faxon, Lexington. Townsend, C. W., Boston.

MICHIGAN

Grand Rapids Public Library. Barrows, W. B., East Lansing.

NEW YORK

Crosby, M. S., Rhinebeck. Woodruff, Lewis B., New York.

CANADA

University of Manitoba, Winnipeg. De Lury, R. E. Ottawa (one volume incomplete).

ENGLAND

Zoological Museum, Tring.

FRANCE

Museum d'Histoire Naturelle, Paris.

SCOTLAND

Royal Scottish Museum, Edinburgh.

SWEDEN

Royal Swedish Academy of Science, Stockholm.

As might naturally be expected the sets are distributed very unevenly. The District of Columbia has 24, Massachusetts 23, New York 22, Cali-

fornia 16, Illinois 11, 21 other states have less than 10 each, the Philippine Islands 1, Canada 11, Great Britain 6, and France and Sweden 1 each—total 175.

T. S. PALMER

Washington, D. C.

A MANUAL OF THE BIRDS OF AUSTRALIA.—Messrs. H. F. & G. Witherby will publish immediately Volume I of the above work edited by Gregory M. Mathews, (Author of "The Birds of Australia") and Tom Iredale. It will be very fully illustrated with coloured and monochrome plates. It is expected to form four volumes of about 300 pages each. Price £3. 3s. per volume.

IN the last report of Mr. Samuel Henshaw, director of the Museum of Comparative Zoology, he states that on July 31, 1920, the collection of birds contained representatives of 2204 of the 2647 genera of recent birds listed in Sharpe's 'Handlist,' and we are informed that the number has been considerably increased since then.

THE AUK

A Quarterly Journal of Ornithology

ORGAN OF THE AMERICAN ORNITHOLOGISTS' UNION

Edited by Dr. Witmer Stone

ACADEMY OF NATURAL SCIENCES, LOGAN CIRCLE,
PHILADELPHIA, PA.

To whom all articles and communications intended for publication and all books and publications for review should be sent.

Manuscripts for leading articles must await their turn for publication if others are already on file, but they must be in the editor's hands at least six weeks before the date of issue of the number for which they are intended, and manuscripts for 'General Notes,' 'Recent Literature,' etc., not later than the first of the month preceding the date of issue of the number in which it is desired they shall appear.

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THE OFFICE OF PUBLICATION

8 WEST KING STREET, LANCASTER, PA.

Subscriptions may also be sent to the Editor, ACADEMY OF NATURAL SCIENCES, Logan Circle, Philadelphia. Foreign Subscribers may secure 'The Auk' through Witherby & Co., 326 High Holborn, London, W. C.

Subscription, \$4.00 a year. Single numbers, one dollar.

Free to Honorary Fellows, and to Fellows, Members, and Associates of the A. O. U., not in arrears for dues.

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Check-List of North American Birds. Second edition, revised, 1895. Cloth, 8vo, pp. xi + 372. \$1.15. Original edition 1886, and third edition, 1910, out of print.

Abridged Check-List of North American Birds. 1889. (*Abridged and revised from the original edition*). Paper, 8vo, pp. 71, printed on one side of the page. 25 cents.

Pocket Check-List of North American Birds. (*Abridged from the third edition*). Flexible cover, $3\frac{1}{4} \times 5\frac{3}{4}$ inches. 30 cents. Ten copies \$2.50.

Code of Nomenclature. Revised edition, 1908. Paper, 8vo, pp. lxxxv. 50 cents.

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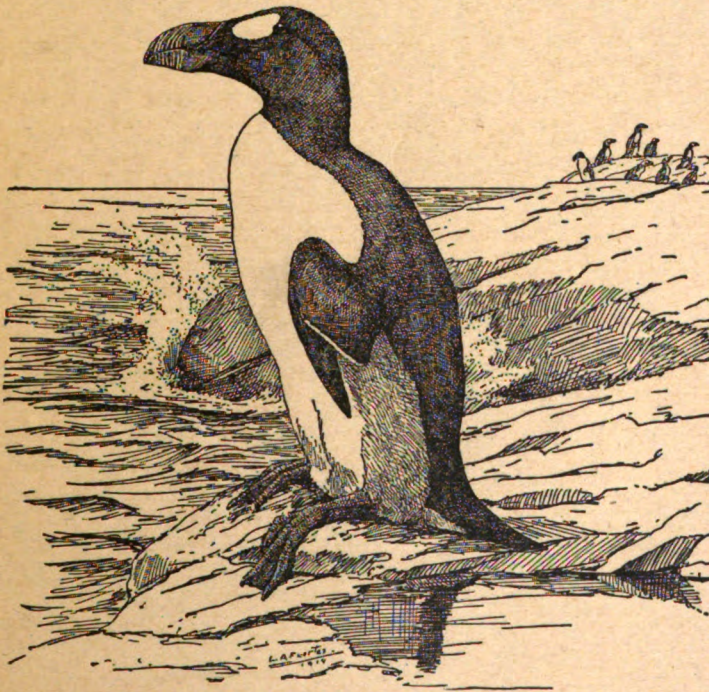
The Auk

A Quarterly Journal of Ornithology

Vol. XXXVIII

JULY, 1921

No. 3



PUBLISHED BY

The American Ornithologists' Union

LANCASTER, PA.

ISSUED SEPTEMBER 1921

Entered as second-class mail matter in the Post Office at Lancaster, Pa.

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THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XXXVIII.

JULY, 1921.

No. 3

WHICH SEX SELECTS THE NESTING LOCALITY.¹

BY H. MOUSLEY.

A ROUGH draft of this paper was prepared in July 1918, about the same time as that of 'The Singing Tree,'² but was not offered for publication with the latter, as I was anxious to further consider the matter, and if possible gain some additional evidence in support of my theory, that it is the male in most cases who really selects or establishes the general nesting site, whilst the female no doubt, in the majority of cases, is responsible for selecting the exact spot or location of the nest on that site. Now this at first sight may seem contrary to all pre-conceived ideas on the subject, for I believe we have all come, in a hazy kind of way, to look upon the female as the principal actor in this site selecting business, whereas I would suggest that it is really the male who stands out as the dominant figure. Now in order to make my point clearer, I will ask you to consider for a moment what is meant by "the singing tree." Is it merely a figure of speech, or a fancy title to a paper,

¹ Read before the Nuttall Ornithological Club, March 7, 1921, by Dr. Chas. W. Townsend for the Author. The present paper was received for publication before the appearance of Mr. Howard's 'Territory in Bird Life' which was reviewed in the April 'Auk' and it is interesting to see how Mr. Mousley has independently evolved the same theory that is so fully set forth in that volume. As Mr. Mousley explains he had reached his conclusions at the time his paper on 'The Singing Tree' was written three years ago,—a paper which, as we have already mentioned seems to have escaped Mr. Howard's notice—Ed.

² 'Auk,' Vol. XXXVI, 1919, pp. 339-348.

or does it stand for something deeper, a something that may mean the home or trysting place of the male, the spot at which the female first finds or hears him, and to which she can at any time return, for in the bird world I think it is the female that finds (not necessarily seeks) the male, and not the male who seeks the female? In support of this, why is it that at migration time so many males of different species (far more than is generally supposed) come in advance of the females, some a few days, others again even a few weeks. I would suggest they come for the purpose of selecting some area of ground over which they can hold sway, in other words they nominally select the general nesting site, to which the females may come either accidentally, or as is most probably the case (especially with the warblers), by hearing the males singing from their favourite trees or other posts, which also act as look-out stations, from which they can sally forth and drive all other interlopers away. Taking the case of the Red-winged Blackbirds (*Agelaius phoeniceus phoeniceus*) and Bobolinks (*Dolichonyx oryzivorus*) which nest near my house, the males in both cases arrive many days in advance of the females, thirty-two in the case of the former, and seven in that of the latter, these being averages for the past six years. Immediately on arrival the males take up their stations, the first named on the marsh, (where they are usually found early in the morning and late in the afternoon, the rest of the day being spent in the adjacent stubble fields) and the latter on certain meadows just in front of my house, and there later on, as well as on the marsh in the case of the Red-winged Blackbirds, will the nests be surely found, thus clearly indicating, I think, that the males in both these instances really selected or established the general nesting site. In further support of this matter it may be remembered that in the spring of 1912 as already recorded¹, Red-winged Blackbirds were unusually numerous, the males on arrival frequenting several new localities, where later on, when the females appeared, nests were duly constructed. Since then the males have never frequented those localities nor have any nests been found, which again is suggestive, I think, of the influence they have exerted in the matter.

¹ 'Auk,' Vol. XXXIII, 1916, p. 168.

Before proceeding further, however, I should like to mention an interesting case which came under my notice during the summer of 1919, and which seems to bear out my contention that the male does not seek the female, but really waits for her to pass over his chosen area. Now the selected area in this case happened to be the orchard at the side of my house which a Least Flycatcher (*Empidonax minimus*) had laid claim to. There for several days I heard his oft repeated "che-béc, che-béc," but when a week or more had elapsed and still there were no signs of a female I became interested, and took especial pains to watch his movements more closely. Just about this time a male Warbling Vireo (*Vireosylva gilva gilva*) also took up a station principally in a large maple tree in front of my house, and two days later was joined by a female. Then came a Baltimore Oriole (*Icterus galbula*) and selected (more especially) another maple tree on the other side of the road, also in front of my house, and in the course of four days (females here for the past six years have arrived as an average seven days after the males) he likewise was joined by a mate. Now here were three male birds, all in possession of "singing trees" and a certain area of ground, from which all other birds were promptly driven, whenever by any chance they encroached thereon. Two of these birds as we have already seen had not long to wait for mates, but the poor little Least Flycatcher although he persistently kept up his "che-béc" notes all through the summer, never became mated, surely a somewhat striking instance that male birds do not forsake their chosen ground, but await the arrival of a female. Was it otherwise, surely this Least Flycatcher could have found a mate by wandering about promiscuously, in which case having found one, they would be able to keep together until such time as nesting operations commenced, or in case of accidentally losing one another, it would be possible for them to come together again, a somewhat easy thing to do when there is a known station to repair to such as a "singing tree," or in the case of the Ruffed Grouse a "drumming log." This may partly account for the fact that when birds are robbed of their first, second, or even third set of eggs, they invariably build another nest in close proximity to the old one, as pointed out in my paper "A Study of Subsequent Nestings."¹ They would do so because the ground had become

¹ 'Auk,' Vol. XXXIV, 1917, pp. 381-393.

familiar to them, and they could always make sure of meeting one another again, which might not be the case if they wandered off to an entirely new locality in search of a fresh nesting site. However, in any case it shows their strong attachment to the chosen area, to which they often return year after year as already recorded. Now as is well known the males of the Ruffed Grouse are polygamous, and in this part of the country there are not a great many to the square mile. How then are the females to find them at the psychological moment without having to wander over a large tract of country? Why, surely, by means of the "drumming log," to which the males repair at certain times of the day, giving notice thereof by the rapid beating of their wings, which can be heard a great way off, and which guides the females to the desired spot. Once having located this, they always know where the male is to be found, and in like manner, surely, the female warbler, let us say, having once located a male at his favourite "singing tree," can always find him there again should she so desire, or they become separated accidentally. I am of course referring here to the initial stages of courtship (which, however, often last for a considerable time), for directly the nest is commenced that of course would take the place of a "singing tree." Reverting to the Warbling Vireo and the Baltimore Oriole, I may say that in both these cases the nests were eventually built in the principal "singing tree" of the male, another indication that this sex again was the chief factor in determining the general nesting site. Of the dozens of warblers' nests that I have found within a very short distance of the "singing tree" or trees of the male, it is unnecessary to go into details, for all I think clearly show, that in this family if in no other, the males are the ones that without doubt are instrumental in determining the general site of the nest. Likewise in other families, I could quote innumerable instances which all seem to confirm the view I have taken up regarding the part exercised by the male in the selection of the general nesting site. Now let us try to examine what the part exercised by the female may be. In the first place, I think it may be rightly assumed, that in the large majority of cases it is the female who generally does most, if not all of the construction work, in which case it seems reasonable enough to suppose that, being the most adept builder, she should

naturally be the most likely one to know the exact requirements her particular nest demanded. The subject, however, is not an easy one to handle by any means, for in many cases the male is an active worker, and may know equally well those particular requirements. Now most of us I imagine have watched a pair of Bluebirds (*Sialia sialis sialis*) at nesting time, inspecting all the likely looking holes in a number of orchard or other trees. First one bird goes in and inspects a hole, then the other proceeds to do the same thing, and on coming out it often appears as though a weighing up of the pros and cons were taking place, but unless one is able to follow them about until the final hole is decided upon, it seems almost impossible to form any adequate idea which sex eventually decides the matter. However, I was fortunate enough on two occasions to be able to follow a pair of Chickadees (*Penthestes atricapillus atricapillus*) about, until the final hole was selected. In both instances this was decided upon very rapidly, first one bird inspected the hole, and then the other (as they had done previously in the case of several others), after which they both retired to a nearby tree, where some form of understanding not apparent to our senses, was evidently arrived at, for with scarcely a moment's delay, first one bird, and then the other, again entered the hole, and commenced to remove the dead and decaying chips, and in due course the nest in each case was constructed. In these two instances it would appear as though the final selection was entirely a mutual one, which might have been expected, seeing that both sexes take part in the construction of the nest, the same as the Bluebirds. Now in the case of a large majority of the warblers this is not so, or at least, it has not been apparent in those which have come under my observation, for the males rarely seem to take any very active part or interest, either in the construction or exact location of the nest. This was particularly apparent in the case of the Blackburnian Warbler (*Dendroica fusca*) mentioned in my "Singing Tree" paper,¹ for I am disposed to think, (in view of the very faint indications there were of a nest) that the date June 10, 1918, was the very one on which the exact spot for the nest was finally decided upon. If this was so, I am in a position to state

¹ 'Auk,' Vol. XXXVI, 1919, p. 346.

that the male could have had very little say in the matter, (although of course he settled the general site by his "singing tree" before the arrival of the female) for he was engaged off and on nearly all day in singing from his favourite tree, and I never once saw him attempt to bring any building material to the nest, whereas I repeatedly saw the female do so, as already described. Many other similar instances could be mentioned, more especially that of the Nashville Warbler (*Vermivora rubricapilla rubricapilla*) recorded in 1917¹, where the male bird I also feel sure had very little if anything to do in selecting the final spot for the nest, although of course he again fixed the general site by his "singing tree," which in this case was only eight yards away from the nest, that of the Blackburnian's being eighteen yards. He like the Blackburnian spent most of his time in singing, but on several occasions he apparently accompanied the female whilst she was gathering building material, for I saw them return together, but he always repaired at once to his tree and commenced to sing. I think judging from my own experience, and that of others, it may safely be assumed that the males of this most interesting family, in the majority of cases, have little if anything to do with the actual selection of the final spot on which the nest shall rest, the females in nearly all cases performing this duty as well as that of constructing the nest. Let us now take another interesting but somewhat different case, in which the female although contrary to one's expectations (as the males of this species assist in the construction of the nest also) still apparently had all the choosing of the final spot for the nest. I refer to the case of the Purple Finch, (*Carpodacus purpureus purpureus*) whose nest was built in a spruce tree in an orchard adjoining the house I was temporarily residing in during the summer of 1918. I first noticed the male usually singing from a particular crab-apple tree, and shortly afterwards he was joined by a mate, when building operations commenced. Strange to say, however, the nest was built on the side of the spruce tree away from that of the apple tree, and where it was invisible to the male whilst singing, nor was it possible for him to take up any other position (except on the spruce itself, and this is what he eventually did on several occasions) and be

¹ 'Auk,' Vol. XXXV, 1918, p. 302.

able to see it, for beyond the spruce was an open space with no other trees in the immediate neighbourhood. In this case I think we may fairly assume the male had very little say in the matter, otherwise he would surely have selected the side of the spruce opposite his favourite apple tree, where he could see the nest and his mate whilst singing. However, this is one of those puzzling little problems of which the solution I suppose will never be forthcoming, but what we can reasonably be sure of, I think, is that the male in selecting that particular apple tree did really fix the general site of the nest, although apparently he had no controlling influence with regard to the exact spot in which it was eventually to rest.

Let us now look at a different case altogether, where the male I think neither fixes the approximate, nor yet the exact location of the nest. I refer to the Ruffed Grouse whose case we have already partly considered. Here I think we are treading on much firmer ground, and can almost assert that the male has nothing whatever to do with the construction of the nest, or even the selection of its general site, which latter I believe is usually far removed from his "drumming log," and is probably unknown to him. There the female hatches out her eggs, and afterwards attends and protects the young without any assistance from the male whatsoever. As regards the Red-winged Blackbirds and Bobolinks, I can only state that so far as my experience goes I have never seen the males of either species engaged in any nest building, nor have I been able to detect any behaviour on their part, which might be construed as assisting the females in selecting a suitable spot for the nest. This being so, I have come to the conclusion that the females of both species, being the constructors of the nests, are likewise the selectors of the exact spots for them to rest in, although these be it remembered have always been on the ground which the male birds had selected to congregate and sing upon long before the arrival of the females.

Of the sea birds I cannot speak with any great degree of confidence, for my opportunities of observing them in their breeding homes have been very limited, but from what I have gathered when visiting the great cliffs at Bempton near Flamborough Head on the east coast of England, I have come to the conclusion that probably much the same conditions exist as with the land birds.

There, however, the male Guillemots (*Uria troille troille*) have to be content with laying claim to a very small area on one of the ledges of rock, (owing to the countless thousands that breed in close proximity) which area becomes the general nesting site, and on which perforce the female is compelled to deposit her egg, without much latitude for selecting an exact spot.

In conclusion, it seems to me that the remarks at the end of my paper 'A Study of Subsequent Nestings' (already referred to) are also very appropriate here, i. e. the more we study these interesting bird problems the more is it brought home to us how very little we really know concerning them, and at best our solutions in most cases can only be approximate ones after all. However, in the present case I think I have some good grounds for believing that the "singing tree" does serve some other purpose than that of a mere fancy title to a paper. It is surely the home of the male bird, where he awaits the coming of his bride, the place from which he loves to sing, and so in time it becomes the loadstone which eventually guides her to him. It also acts as a lookout post, from which he can perceive any encroachment on his domain and at once resent it by immediately attacking the intruder, which is plain to be seen almost any day during the breeding season. But it accomplishes one other thing also, I think, for it surely demonstrates that of the two sexes the male in the majority of cases really selects or establishes (call it which you like) the general nesting site, which is the main purport of this paper.

Hatley, Stanstead Co., Que.

IMPRESSIONS OF BIRD-LIFE IN FRANCE.

BY E. L. POOLE.

Plate XIV.

LIKE most American students of bird-life I had long cherished a desire to form the acquaintance of some of the old-world birds that are so frequently mentioned in literature. The experiences of John Burroughs and Frank M. Chapman during their trips abroad only increased my curiosity to really see and hear some of these famous songsters and to compare them with our own favorites.

It was in the summer of 1918, while serving with the American Expeditionary Forces, in France, that I finally had an opportunity to gratify my ambitions in this direction.

The trip across was made at a time when submarines were the primary objects of interest, but this proved to my advantage, ornithologically, for it caused us to go far out of the usual course, and pass around the northern coast of Ireland, near the large breeding colonies of sea birds which lie off these coasts.

During the first day out of New York, July 30, we were attended by numbers of Wilson's Petrels (*Oceanites oceanicus*) which were not seen after that evening, and not another bird was noted until three days later when we passed a school of whales which were attended by numbers of Greater Shearwaters (*Puffinus gravis*), Wilson's Petrels, (*Oceanites oceanicus*) and at least one Fulmar (*Fulmarus glacialis*).

On the seventh we saw more Shearwaters, another Fulmar and a Cormorant (*Phalacrocorax carbo*).

Finally, on the ninth we were warned of our approach to land by the appearance of a flock of the Common European Gulls, (*Larus canus*). Upon the following morning we found ourselves in sight of the coasts of Ireland and Scotland, while the water all about us was literally alive with numbers of Razorbills, (*Alca torda*), Murres, (*Uria troille troille*) Puffins (*Fratercula arctica arctica*), Arctic Terns (*Sterna paradisæa*) and Gulls of several species.

The harbor of Liverpool was filled with a living snow-squall of Gulls, including the Herring Gull, (*Larus argentatus*) three or four

Great Black-backed Gulls (*Larus marinus*) and numbers of the Black-headed Gulls, (*Larus ridibundus*).

The return trip in July 1919, revealed no new species except the Storm Petrel (*Thalassodroma pelagica*) which we met on the 20th, one day out from St. Nazaire, and saw for two days following. From then until the 29th no birds were seen. On that day we again met the Wilson's Petrels, and the following day docked at Hoboken.

Most of the following observations were made in the vicinity of Is-sur-Tille, Cote d'Or, in the foothills of the Vosges Mountains, and at Montoir, a small village some seven kilometers east of St. Nazaire, on the river Loire.

The country about Is-sur-Tille is rolling, and checkered with patches of pine, which is seldom allowed to reach any considerable size. The hardwoods along the Tille consist largely of planes, poplars, and willows, the latter invariably being lopped off at a height of eight feet or so.

Fences are very rare in this country, their place being taken by thorn hedges, with an occasional stone wall or ditch.

The Tille is simply a large meadow-brook which meanders through broad meadows and patches of thorns and alders, with now and then a strip of reeds of varying depth.

The Montoir district is bordered on two sides by tidal meadows, which are almost entirely inundated during the rainy season, from October until March, altho the Americans succeeded in reclaiming certain areas by drainage. The remainder of the camp faced an extensive peat bog which is covered by at least three feet of water during the winter, but dries up completely in April, the drainage being accomplished by means of a large canal.

The surrounding country is cut up into small farms, fenced everywhere by ditches and hedges of thorn, pollard willows and oaks.

With the exception of the main military roads the surrounding country is traversed by the most picturesque lanes, that are often lined by a dense prickly bush which is covered with handsome yellow flowers throughout the winter.

While the number of species observed was less, comparatively, than would be seen in a like period in our Eastern States, the num-

ber of individuals was about the same. These conditions are probably due to the country having been longer under cultivation, and the consequent extinction of those species which were unable to adapt themselves to the changes in environment.

The following extract from my note-book gives a fair idea of the character of the bird-life about Montoir during the breeding season. "June 8. Montoir. Out lane around the peninsula near camp. Summer well advanced. Marsh completely dried, except for a few ditches. Roses, honeysuckle, buttercups. Thistles just opening.

Swifts and Swallows flying over the meadows and about barn-yards. Three or four Stonechats are perched on the highest bushes along the hedgerow, now and then darting to the ground to feed. They have a nest in a dense clump of thorns nearby.

One or two Whitethroats are singing in the hedges. A couple of Pies fly over and alight in a poplar, only to continue their flight as we approach. A Blackbird flies up the row ahead of us, and a Hedge Sparrow darts down among the reeds in a partly dried up ditch along the road.

At intervals a Chaffinch sings its plain but welcome song from the roadside trees, and one of the Red-backed Shrikes makes a short detour out over the meadow only to return and take up its point of vantage in the hedge.

A small group of Goldfinches are feeding among the opening thistles a short distance out in the field, and two or three Carrion Crows and a Green Woodpecker wing over the meadow, the latter looking, from a distance, exactly like our Flicker.

As we turn to go, a pair of Greenfinches fly out of the Hawthorns and cross over to some trees on the other side of the road, while a Yellow Bunting sings its monotonous ditty from somewhere in the thick foliage of the hedge.

But beyond all, from the meadows and air in every direction comes the incessant jargon of the Skylarks, forming a background of sound to the whole scene."

The following notes cover all the species which I was able to identify with certainty, all the more doubtful records having been omitted.

The disadvantage of being unable to find a satisfactory work on

French bird-life was met by making a series of field-sketches of the birds as I observed them. These were, for the most part, identified without difficulty upon my return.

These notes cover the period between September 22, 1918 and July 5, 1919.

Larus melanocephalus. MEDITERRANEAN BLACK-HEADED GULL.—Common on the Rhone at Lyons. February 14 and 15.

Larus marinus. GREAT BLACK-BACKED GULL.—Three seen over the Montoir marshes during a storm on April 26, 1919.

Larus argentatus. HERRING GULL. A flock of 20 flew over the Montoir marshes, January 18. Abundant on the Loire at Savenay, February 10; five seen at Montoir. April 13. and six on April 17; also common at Lyons. February 14 and 15.

Anas platyrhynchos. MALLARD. A common migrant or possibly summer resident on the Montoir peat bog. April 19 to June 14. On one occasion a pair of these ducks alighted in a dry pasture near some cattle; the first time that I have ever seen wild ducks do this.

Gallinula chloropus chloropus. MOOR HEN.—One was captured alive in the British rest camp at Le Havre. August 13. Another seen on the River Tille, where it was flushed from dense reeds bordering the stream, September 22.

Ardea cinerea. COMMON HERON.—One seen on February 25 at Montoir. This was my only record. Seen in flight it resembles a small Great Blue Heron,

Actitis hypoleucos. COMMON SANDPIPER.—Apparently a scarce migrant. Three or four seen along the canal that drains the Montoir bog on April 26 constitute my only record of this species.

Vanellus vanellus. LAPWING.—Tolerably common transient. On February 2 I saw two flocks of from 25 to 30 individuals each. On that day I met a Frenchman who had shot and wounded one, which he permitted me to sketch. While on the ground their actions suggest the Killdeer, but they seem more sluggish and were altogether silent. The flight is heavy and the wing beats regular, suggesting that of our Green Heron.

The flocks fly in close formation, wheeling over the meadows almost as one; now showing the white breasts, or again wheeling so that only the black backs are visible, presenting a most attractive picture.

Several were also seen on February 10 near Savenay, and two over the Montoir marsh, May 4.

Perdix perdix perdix. PARTRIDGE.—Common both at Is-sur-Tille and about Montoir. These are somewhat similar in habits to our Bobwhite, but are larger. On several occasions I heard them utter a peculiar harsh call when flushed.

Streptopelia turtur turtur. **TURTLE DOVE.**—Summer resident. Not seen until May 11, but common thereafter. Certain dead trees in the Montoir bog were often literally covered with them at times, although they seem to be much sought after by the native pot-hunters. Their mournful cooing could be heard at all hours of the day, echoing through the countryside and reminding one very often of our Mourning Dove at home.

Columba palumbus palumbus. **WOOD PIGEON.**—Common about some of the squares and parks in Paris, May 17 and 18. The conspicuous white wing-patches easily distinguished them from the domestic pigeons with which they did not associate.

Milvus milvus. **KITE.**—February 2 I saw two soaring on motionless wings over the flooded Montoir meadows. The feet appeared decidedly reddish.

Circus aeruginosus. **MARSH HARRIER.**—Apparently a tolerably common summer resident. It hunts in much the same way as our Marsh Hawk, but appears larger and heavier. Individuals were seen over the Montoir marshes May 11 and June 14 and 15.

Circus cyaneus. **HEN HARRIER.** Common summer resident. Arrived, April 26. Some individuals appear fully as light as Herring Gulls. This species is indistinguishable in the field from our Marsh Hawk.

Accipiter nisus. **SPARROW HAWK.** A rather common permanent resident. Resembles the Sharp-shin very closely. Its usual method of hunting in this country is to skim over the fields at a low elevation, rising just enough to clear the hedges; thereby enabling it to surprise any birds that may be feeding away from cover.

Buteo buteo buteo. **BUZZARD.**—Apparently a tolerably common resident at Montoir. More common in winter. It takes the place of our Red-tail, and has a similar call.

Falco tinnunculus tinnunculus. **KESTREL.**—Common resident. Resembles our Sparrow Hawk very closely. It is apparently feared by the Skylarks, which it appears to hunt regularly in winter. The call is similar to that of *F. spawerius*, too, but is best described in one syllable. "klee, klee", etc.

EAGLE.—On January 17 an eagle, of unknown species, flew over the Montoir meadow.

Pandion haliaetus haliaetus. **OSPREY.**—One seen April 27, flying over the flooded bog at Montoir.

Tyto alba alba. **BARN OWL.**—The carcass of a Barn Owl was seen hanging from a pole in a grain-field on April 19, and hung in the same position for several weeks. It was decidedly smaller than our variety.

Strix aluco. **BROWN OWL.**—One seen, December 25 and 26. Surprised while hiding in a vine covered tree, from whence it flew to another a short distance off, bringing to the scene scores of Tits, Chaffinches, a couple of Jays and a Green Woodpecker, which created a great commotion for some time.

***Athene noctua noctua*.** LITTLE OWL.—December 25 and April 28, I found this to be the source of a peculiar kitten-like cry that I had heard once or twice at dusk near Montoir. Apparently nesting in a lopped-off oak. It looks much like an Acadian Owl.

***Cuculus canorus canorus*.** CUCKOO.—Abundant summer resident. arriving April 20. Its call is just like the regulation cuckoo clock, with much the same quality as the Mourning Dove—a far-reaching call. This Cuckoo is not as shy and retiring as ours, but seems very restless and flies from place to place with a hawk-like flight, carrying the head in a strained position.

***Alcedo atthis ispida*.** EUROPEAN KINGFISHER. A pair were seen along the Tille (Cote d'Or) on two occasions, September 22 and 29. They are certainly among the handsomest birds here, fairly glittering as they fly past, uttering their weak rattle or scream.

***Picus viridis virescens*.** GREEN WOODPECKER.—A common resident wherever the trees have been allowed to grow to their normal size. It resembles our Flicker in many ways. Feeds much on the ground, and has a loud rolling call suggesting somewhat the whinnying of a colt. To all intents and purposes it is simply a Flicker dipped in yellowish green dye.

***Dryobates minor* (*hortorum* ?)** LESSER SPOTTED WOODPECKER.—One seen December 25, at Montoir. It seems to take the place of our Downy.

***Dendrocopos major pinetorum*.** GREATER SPOTTED WOODPECKER.—June 16 and July 4. my only Montoir dates for this species. Also seen twice December 1 and 8, at Is-sur-Tille. It seems to represent our Hairy Woodpecker in this fauna.

***Jynx torquilla torquilla*.** WRYNECK.—One seen on a towpath along Montoir canal, June 12. Feeding on ants, apparently. When disturbed it perched on an upright stick and craned and twisted its neck in the grotesque manner peculiar to this species.

***Caprimulgus europaeus europaeus*.** NIGHTJAR. Started one up April 20, from an unfrequented road.

***Apus apus apus*.** SWIFT. Abundant summer resident. Larger than ours, with a slightly forked tail, and slower in its movements. Its only note is a harsh wheezy scream.

***Alauda arvensis arvensis*.** SKYLARK. An abundant resident at Montoir, being heard at all hours of the day. They commence to sing in February and are seldom silent after that. The usual call note is a loud "dear, dear, dee'ar" suggesting the call of our Killdeer, but it sometimes utters a low "churring" note when flushed. The song is a loud, mad outburst, rivalling that of our Bobolink, but louder and more piercing, suggesting certain notes of the Meadowlark in quality. The Skylark is one of the most aggressively energetic birds here and usually carries its crest erect whenever suspicious or excited. It is very pugnacious, and during the mating season the males were constantly fighting or attempting to outsize one another.

Lullula arborea. WOOD LARK.—A common winter resident, frequenting drier localities than the former species. It is less active and noisy than the other, and more shy. I have no record of it after February 2.

Garrulus glandarius glandarius. JAY.—Apparently a common resident at Montoir. Much larger and heavier than our Blue Jay. The conspicuous white rump and wing patches are excellent identification marks. The flight resembles that of our Belted Kingfisher and the only note is a harsh croak.

Pica pica pica. MAGPIE.—Abundant everywhere in France. One of the most characteristic and conspicuous birds. It has a varied vocabulary, ranging from a harsh parrot-like screech to various low chuckling notes. On one occasion I observed a trio of Kestrels and a small flock of Pies engaged in a game which seemed to afford both parties great amusement. The Kestrels would hang over the bushes in which the Pies were concealed and dart down on one whenever it exposed itself. Thereupon the whole assemblage of Pies would pursue the Kestrel until it returned to its former elevation. This performance continued for at least half an hour.

Corvus corone corone. CARRION CROW.—Common everywhere, but more solitary than the Rook. Easily distinguished from the latter by its harsh croak and much larger size. A pair nested in a large elm in the Montoir bog.

Corvus frugilegus frugilegus. ROOK. Abundant resident. It has a weak nasal caw resembling the Fish Crow's. It is gregarious, nesting in colonies wherever suitable woodlands can be found.

Corvus monedula spermologus. JACKDAW. Abundant about the Cathedral of Nantes, February 10.

Corvus cornix cornix. HOODED CROW. One seen over the marshes at Montoir, March 19. Its call is weak and nasal, somewhat like the Rook's.

Sturnus vulgaris vulgaris. STARLING. Resident, but more abundant in winter, when it feeds on the flooded meadows, wandering about in great compact flocks and resorting to tall pines to roost.

Passer domesticus domesticus. HOUSE SPARROW. Uniformly abundant, but probably less so than in certain localities here.

Passer montanus montanus. WOOD SPARROW. A rather common resident in country districts. One pair nested in the temporary hospital buildings near St Nazaire. Resembles a small highly colored House Sparrow.

Acanthis cannabina cannabina. LINNET. Abundant summer resident, nesting among the hedges. First seen April 19. It reminds one somewhat of our Redpoll in appearance and habits, feeding mainly in cultivated fields and gardens. It has a very sweet goldfinch-like song.

Carduelis carduelis carduelis. EUROPEAN GOLDFINCH. Common summer resident, resembling our Goldfinch much more in habits than in

appearance. I know of few prettier sights than a group of these Goldfinches feeding among the apple blossoms. Like our species, they are so fond of thistles, and every large patch of thistles was sure to harbor a small flock. Arrived April 13.

Emberiza cirius. CIRL BUNTING. A common resident, generally distributed. Nesting among the hedgerows. Its song is a droll, wheezy performance.

Emberiza citrinella citrinella. YELLOW BUNTING. A common resident; in winter feeding along with the Ciril Buntings, Chaffinches, and Greenfinches, about the grain warehouses in the American railroad yard. In summer they frequent hedges, nesting among the Hawthorns. Their song is a monotonous repetition, "sweet, sweet, sweet, sweet, sweet."

Emberiza schoeniclus schoeniclus. REED BUNTING. A common summer resident on the Montoir bog, living among the reeds and coarse sedges, where it dodges in and out among the thick growth which borders the pools. First seen May 4. Also rather common in similar localities along the River Tille in autumn.

Emberiza calandra calandra. CORN BUNTING. Common summer resident near Montoir. First seen, April 13. This looks much like a large grayish Song Sparrow. Its song is a very good imitation of our Grasshopper Sparrow's, but is considerably louder, and is often given while in flight, the singer gliding back into the grass with wings, legs and tail dangling, reminding one of the flight performance of the Yellow-breasted Chat.

Chloris chloris (subsp?). GREENFINCH. A tolerably common resident, associating in the winter with the Yellow and Ciril Buntings and Chaffinches. In summer it frequents the dense hedges.

Fringilla coelebs coelebs. CHAFFINCH. An abundant resident about Montoir. Probably the most abundant winter species in and about the villages. In the winter plumage it bears a decided resemblance to our Goldfinch. One of the Chaffinch's call notes is exactly like the call of our Chewink. Its song starts out like that of our House Wren rising in a crescendo, then breaking into an odd jargon resembling the song of the White-eyed Vireo. At one farmhouse the inmates kept a brood of young Chaffinches in a cage, hanging in a hedge. The parents were feeding them.

Pyrrhula pyrrhula europaea. BULLFINCH. Seven seen on April 19 at Montoir, feeding on buds in tree-tops. Common during September and October at Is-sur-Tille. In habits it resembles our Goldfinch.

Delichon urbica urbica. MARTIN. Abundant in the Province of Cote d'Or until September 22. Apparently scarce in Brittany (only one seen, June 12). In Is-sur-Tille they nested below the eaves of the houses on the main street, building retort-shaped nests like those of our Cliff Swallow. One nest was actually in the corner of a window in the heart of the village.

Hirundo rustica rustica. SWALLOW. Summer resident, arriving April 10. This is almost identical with our Barn Swallow, both in appearance and habits, and is equally abundant.

Riparia riparia riparia. SAND MARTIN. Abundant summer resident. First seen April 13, after which, for several weeks, the flooded Montoir bog was literally alive with them. They are identical with our Bank Swallow.

Lanius collurio collurio. RED-BACKED SHRIKE. This handsome Shrike was quite common in some localities, three or four pairs nesting within a half mile along a thorn hedge skirting the Montoir bog. They appear to feed exclusively on insects, as the other birds display no fear of them. The strikingly marked white and black tail is common to this species, the Wheatear, and the Whinchat. The only note that I ever heard this bird utter is a harsh cry like that of our Northern Shrike. It is usually seen perched on some exposed twig, from which it flies to the ground to pick up its insect prey.

Lanius senator senator. WOODCHAT SHRIKE. One seen June 14. at Montoir.

Muscicapa striata striata. SPOTTED FLYCATCHER. Common along the Tille (Province of Cote d'Or) during the last week of September. It resembles our Phoebe in feeding habits.

Muscicapa hypoleuca hypoleuca. PIED FLYCATCHER. One seen, June 3, in yard of Base Hospital at St. Nazaire. Apparently like our flycatchers in feeding habits.

Phylloscopus collybita collybita. CHIFFCHAFF. Common summer resident. First seen March 30. Resembles one of our Vireos in habits and appearance but has a characteristic ringing song—a monotonous repetition of its name.

Phylloscopus trochilus trochilus. WILLOW WARBLER. First seen, April 13. This resembles our Warbling Vireo in appearance, but is more active, and sings incessantly while it feeds. It is one of the finest songsters. The song resembles a part of the Indigo Bunting's, but is sweeter and lacks the harsh finch quality.

Prunella modularis modularis. HEDGE "SPARROW." A common resident, living in hedges throughout the country. It has a very sprightly and attractive song, suggesting that of our Indigo Bunting. This species is often hard to observe because of its shyness and preference for thick hedges.

Phoenicurus phoenicurus phoenicurus. REDSTART. Two seen April 19, at Montoir. One was singing a sweet plaintive song reminiscent of our Vesper Sparrow, but softer.

Anthus pratensis. MEADOW PIPIT. An abundant winter visitant at Montoir, feeding on the flooded marshes with the Pied Wagtails and Starlings. A counterpart of our native Pipit.

Anthus trivialis trivialis. TREE PIPIT. A tolerably common sum-

mer resident. First seen March 30. Its usual song is sweet but monotonous, but its flight song resembles in a miniature way the outburst of the Skylark, as it starts up from its perch with wings vibrating rapidly, and after ascending for perhaps 100 feet, glides downward, singing all the while, and finally flutters to its perch with the wings extended low, legs hanging, and tail held in a vertical position.

Motacilla alba lugubris. WHITE WAGTAIL. Abundant all winter at Montoir, wading about the flooded marshes; becoming less common as the spring advanced, when its place was taken, to a large extent, by the next species. I never heard its song, but once witnessed a curious chattering duet between two males, which fluttered before each other in the air, with their long tails opening and closing during the performance. Ordinarily the tail is wagged quite smartly in walking, and the head bobs backward and forward with each step. While the farmers are plowing the Wagtails desert the marshes and follow the plow, sometimes fairly covering the freshly turned earth. Their call note is a nervous sharp "tseep, tseep, tseep."

Motacilla flava rayi. YELLOW WAGTAIL. Resident, but much more abundant in summer, nesting in the marshes. Altho essentially a ground walker, it frequently perches on weed stalks and wires to give its "song," simply a loud explosive "k'seet." Both of the Wagtails fly gracefully in long undulations, opening and closing the tail with each bound.

Troglodytes troglodytes troglodytes. WREN. This species resembles more closely the Winter Wren. As a songster it is far superior to our House Wren. I heard its full song in December at Is-sur-Tille and found it common at Montoir.

Certhia sp?. CREEPER. Common in autumn and winter at Is-sur-Tille. It is not distinguishable from our Creeper.

Sitta europaea caesia. NUTHATCH. One seen, February 14 at Tete d'Or Park, Lyons. Reminded me of a large edition of our Red-breasted Nuthatch, and like that species is fond of pines.

Parus palustris longirostris. MARSH TITMOUSE. Common in September along the Tille. Only one flock of four seen near Montoir March 30. They resemble our Chickadee very closely, both in appearance and habits.

Parus major major. GREAT TITMOUSE. Abundant resident, generally retiring to wilder sections to breed. They become very tame in winter, coming right into the dooryards to feed, and may be approached very closely. This and the next species are often seen in company, the present one being much the more common. Its notes are a "see-saw" and various chattering and scolding notes resembling the Chickadee's.

Parus caeruleus caeruleus. BLUE TITMOUSE. I found this diminutive titmouse tolerably common everywhere, altho never as abundant as the Great Titmouse with which it commonly associates. It is the most energetic and acrobatic of its tribe. The nest is placed in knot-holes in the gnarled oaks which abound throughout the country.

***Sylvia communis communis*.** WHITETHROAT. The Whitethroat is one of the commonest and most persistent singers. Upon its arrival (April 19), the song is most welcome. It is extremely vivacious and reminiscent of our Bobolink, or the Skylark, but softer. As the season wears on, however, it becomes rather tiresome. The Whitethroat is very energetic, its crest, cheeks, and throat feathers usually being held erect. It seems to delight in hiding among the thick hedges and scolding whenever approached.

***Sylvia hortensis hortensis*.** GARDEN WARBLER. This is one of the very finest songsters that I encountered. Its song resembles that of our Orchard Oriole, but is less throaty and more "warbler-like." May 4 and June 14 at Montoir.

***Luscinia megarhyncha megarhyncha*.** NIGHTINGALE. A summer resident, inhabiting dense thickets where it is very difficult to observe, altho its loud and varied song carries to a great distance. I heard it singing at noon on a cloudy day. Part of the song is very rich and full, but certain harsh notes are reminiscent of the Chat's.

***Acrocephalus aquaticus*.** AQUATIC WARBLER. One seen along the Tille, dodging among thick shrubbery near the stream, September 22.

***Acrocephalus schoenobaenus*.** SEDGE WARBLER. A common summer resident in suitable localities on the Montoir bog. First seen May 2. These odd little warblers are very wren-like in habits, dwelling in thick undergrowth and hedges skirting the drainage ditches. They are very secretive and hard to observe, but their loud song and wren-like scolding notes are constantly in evidence in the localities which they inhabit. The song resembles a combination of that of the Marsh Wren and Yellow-breasted Chat.

***Erythacus rubecula rubecula*.** REDBREAST. A common resident inhabiting hedges and brush piles, generally in the vicinity of houses. Its droll song is a curious medley, containing a variety of wheezing and buzzing notes.

***Pratincola torquata rubicola*.** STONECHAT. Resident, much more abundant in summer. Resembles our Bluebird in its feeding habits, perching on a fence post or projecting twig in a hedge and flying to the ground to pick up its food. It sometimes hovers over the grass where a suitable perch is not to be found.

***Pratincola rubetra rubetra*.** WINCHAT.—May 11, three or four seen. Resembles the Stonechat in habits, perching on weed stalks and flying into the grass to feed. Its song is a weak little warble suggesting the Bluebird's, but not so rich in quality and contains some buzzing notes. Common in September at Is-sur-Tille, feeding on berries.

***Regulus regulus regulus*.** GOLDCREST.—Local winter visitant, resembling our Golden-crowned Kinglet very closely, both in appearance and habits. First seen at Is-sur-Tille, September 29. Last seen at Montoir, January 1.

Turdus philomelus philomelus. SONG THRUSH. Resident, more common about Montoir in the winter, when it fed on the marshy meadows bordering the bog. Its method of feeding and general actions at this time recall our Robin. Its song, however, is somewhat like the Thrasher's but contains some harsh notes.

Turdus viscivorus viscivorus. MISTLE THRUSH.—One at Montoir, January 1. Quite as large as our Brown Thrasher.

Turdus musicus. REDWING.—Only one identified, December 31, at Montoir.

Turdus merula merula. BLACKBIRD.—A common resident. Acts much like our Robin, feeding on the ground and flying up into hedges when alarmed, with the loud piercing cries which are so often heard from Robins at dusk. Their song, however, resembles that of the Thrasher, without the repetitions. Some phrases are almost as rich as those of the Wood Thrush.

Oenanthe oenanthe oenanthe. WHEATEAR.—One feeding in a wet meadow, at Montoir March 30.

Reading Public Museum, Reading, Pa.



THE BIRDS OF LAKE POOPÓ, BOLIVIA.

BY WILLIAM RAY ALLEN.

THE overflow of Lake Titicaca, especially voluminous during the rainy season, is poured out into the Bolivian Lake Poopó (Aullagas) and the salt marshes and lagoons of Coipasa. Despite a wide-spread popular belief concerning an underground outlet to the Pacific, the entire rainfall is probably taken up by evaporation. The river Desaguadero by which Titicaca drains into Poopó passes near Calacoto through a rock-channel in a narrow valley. This acts as a valve, regulating the flow of the water above. Lake Titicaca, therefore, varies in its level no less than five feet between its highest and its lowest known stages; and Lake Poopó below rises and falls with greater seasonal regularity. It cannot fluctuate more than two or three feet, while the excess overflows into the salt marshes.

As a result of the above situation we have the almost anomalous

occurrence of an extremely flat flood plain at an extremely high altitude; and it is of considerable magnitude also. Lake Poopó is at an elevation of 12,000 feet; it is fifty miles long and half as wide. The surrounding pampa and salt-plain has several times the area of the lake. The greatest known depth of the lake is thirteen feet; and the surrounding plain, except for a few ancient protrusive mountain peaks, exhibits but little greater relief than the lake bottom itself.

The immediate approaches of the lake present a very slight gradient. A zone, in width five to ten miles around it, is nowhere more than a few feet above the water level, except for a few low dunes. The lake may be seen from a distance only by climbing a mountain slope. Due to the confusing mirage, as one draws near he is never sure of sighting it until within less than a kilometer from the water's edge.

The relatively great variation in level under these circumstances brings about a seasonal increase and decrease in the size of the lake that is considerable. The writer visited it in January and February, 1919,¹ at the beginning of a belated rainy season. There was still exposed about the lake's margin a belt of hard, sun-cracked mud a mile wide, which at the height of the rainy season is under water. Moreover the writer waded out into the lake another mile before encountering water that was knee-deep.

In spite of the steady influx from the Desaguadero the deepening of the water at a given point does not proceed with regularity. There is a nearly diurnal rhythm in the overflow upon the mud zone, and a lesser withdrawal between advances. The whole acts very much as a *seiche*. But there is nightly a high south wind which is probably responsible for piling up the water upon the northerly shores. With the increment of water from the Desaguadero each night's flood advances a little further than the preceding.

As is to be expected, the north end of the lake has a much greater amount of mud. At the southern extreme, near Challapata, there is much more sand and the water is clear, except about the mouths of rivers. This end of the lake is fairly free of emergent

¹As a member of the Irwin Expedition, and traveling fellow of the University of Illinois.

vegetation, such as bulrushes, while the northern portion of the lake, especially toward the east shore, produces enormous areas of the same. The southern portion, on the contrary, is rich in one or two species of Potamogeton.

The foregoing lengthy introduction may aid in explaining the few observed facts of local bird distribution which follow. Since Lake Poopó is so nearly inaccessible and so few observers have visited it, any meager, incidental data may have some value.

The reedy northern end of Lake Poopó was found inhabited by a considerable number of species. The bird fauna is not unlike that of the littoral of Lake Titicaca, but lacking some of its forms. There were among others: the Flamingo (*Phoenicopterus andinus*); Ducks; Coots (the Choca, *Fulica* sp.); Ibises; Gulls (*Larus serranus*); Heron (Pajaro bobo); Sentinal (Leke-leke, *Vanellus resplendens*); Hawks (Aquila); Negritos (close relative of our Red-winged Blackbird.) The above were all in abundance upon both lakes.

Correlated with the shallowness of the water of Poopó is the absence of diving-birds. The abundant flightless grebes of Lake Titicaca are wanting. The cormorant, which prefers diving from an elevation, finds unfavorable this lake of only two dimensions. No Gallinules were observed, nor the great goose-like Huayata (*Bernicla melanoptera*.)

Still fewer species were found at the southern end of Poopó. A few plover species, the Gull, and the Flamingo were the only birds to be seen.

The black-headed Gulls occur everywhere on the pampas, even following up the courses of small streams. On Poopó they were few in number, being here reduced to feeding upon the small dead fishes which were to be found.

The Flamingo is rather uniformly distributed about the lake, usually occurring in companies of a score or more, and working in extended order in water of the depth of from one to two feet. In such waters where cover for the approaching hunter is wanting it is manifestly impossible to get within easy gunshot. They may be followed long distances, and will always keep walking ahead of the pursuer, foraging as they go, and seldom resorting to flight. The bird presents a conspicuous, but altogether decep-

tive target. Furthermore at some distance one's image of a Flamingo company becomes grotesquely confused with the elongated reflections in the water and with the mirage. It is thus difficult to gauge the distance, even at long gun-range. This bird occurs in surprising numbers, for it has not only the protection of its own wariness, and of its remoteness, but it is about the only bird of the high Andes which receives much legal or sentimental favor. The sight of the Parihuana usually elicits exclamations of pleasure in any group of men. No evidence of their nesting was seen in either Titicaca or Poopó. The only nesting sites accurately reported by the inhabitants were both in northern Chile—Laguna Roja near Collahuasi, and another lake near Chiu-chiu.

The southerly shores of Lake Poopó are *par excellence* the abode of shore-birds. Several species of plover were taking full advantage of the situation. The writer estimated that for each mile of shore line there were well in excess of ten thousand birds. By all evidence they were chiefly winter residents. No indications of nesting on the part of any species were noted here, nor were the sex glands in the enlarged condition of the breeding season. However, just across the Chilean border at Lake Ascotan, ducklings were found that were nearly old enough to leave the nest. On that morning the temperature at Cebollar across the lake was 14° F., the usual temperature of the season. The nest was adjacent to a warm spring-fed pool at the foot of an extinct volcano. Some heat may have been derived from that source, making the spot more habitable.

Several factors probably contribute to the determination of bird distribution in the altiplane. Lake Titicaca's production of the greater number of species cannot be ascribed to any one or two of these factors. It is much the larger and deeper body. Not only as a matter of size, but through its striking effect in tempering the climate, is this important. In variability of contour—shore and bottom—Titicaca stands at one extreme, Poopó at the other. Aside from its rushes and cattails, the latter affords no shelter whatever.

Lake Titicaca does have remarkably few plant and animal species for the Torrid zone. But, since it is tributary to Poopó and at a higher elevation, it might reasonably be expected to produce the fewer, except for the above environmental factors.

The considerable salt content of Lake Poopó does not likely affect the bird population directly. Yet the latter may be influenced through the effect of the salt upon other organisms. Laguna Salinas is only slightly higher than Titicaca, and within its basin, though cut off from it. In contour, bottom, etc. it is comparable to Poopó. But through its salinity, which is much higher than that of Poopó, it has eliminated virtually all plant life. Very few animal species exist in it—no essentially aquatic species except Phyllopoda, not even fish. Hence, on account of food, there are few birds, if for no other reason. There are numerous Plover, and a few Flamingoes, Ducks and Gulls. Other conditions being essentially the same, then, as in Poopó, this lake pretty well demonstrates wherein salinity does affect the avifauna.

Lake Poopó's fluctuations in level upon its flat flood plain result in a striking separation of food materials, not unlike the sorting of littoral forms upon tidal flats, through their relative size and specific gravity. Here the materials sorted are few in kind. The shore-birds always feed in water of not more than an inch or two in depth, and rarely a hundred feet from its margin. Hence they were sometimes feeding on an advancing, sometimes a retreating lake margin. In each situation some were killed and the alimentary tracts examined for parasites. Especially at the north end of the lake, the stomachs were at one stage of the water filled almost entirely with weevils which were being driven from the shelter of the dry sun-cracks. Upon the withdrawal of the water the Tiutico fed nearly exclusively upon the seeds of *Potamogeton* or *Malacochaete* which were being left by the ebb. The change in diet corresponded always with the stage of the water.

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MOULDS AND BACTERIA ON EGG COLLECTIONS.

BY FREDERIC H. KENNARD.

DURING the summer of 1916 there came into my possession a small collection of New England eggs, some 1250 in number, which I particularly prized, as having been personally taken by a friend who had passed away sometime before, but with whom I had been on many a collecting trip; and with the history of whose personally collected eggs I was rather intimately acquainted.

Upon acquiring the collection I was surprised to discover upon a number of the eggs, small spots of what appeared to be a tawny mould scattered over the surface. These spots, varying in color from "tawny-olive" to the brighter "ochraceous-tawny" of Ridgway¹ were small, often so minute as to require a glass for their discovery; and seemed to be pretty generally distributed over the surface. Many of the infected eggs had but a spot or two, which were hard to distinguish in some cases from markings, while on others there were larger and very evident spots, often with a characteristic dendritic appearance, and many of them with fine filaments of the cotton on which they had been laid still adhering. On a very few of the eggs, soiled seabirds' and the like, there seemed to be other mould of some common kind.

I applied to several friends at this time for advice; but only two of them had ever encountered similar trouble, and while they knew of no sure cure, I was advised to clean the eggs with Bon Ami soap, applied with warm water and a soft rag; and then after drying, to put them away in a dry place.

Upon a careful examination of every egg in the collection with a ten-power magnifying glass, I found that apparently one or more eggs in eighty-nine sets, out of a total of 262,—over thirty per cent,—were more or less infected.

Of these I broke up thirteen sets—several accidentally, and the rest deliberately,—in order to find out whether or not the insides of the shells were similarly affected. Aside from a very few exceptional cases, where the growth happened to develop about the

¹ Color Standards and Color Nomenclature by Robert Ridgway.

blow-hole, and for perhaps half a millimeter around its inner edge the insides of the eggs appeared to be free of the trouble.

After this examination, I carefully cleaned all the eggs, the infected, as well as those which appeared to be uninfected, with Bon Ami soap;¹ and found the spots readily removable, except in a very few aggravated cases, in which the tawny growth seemed to have eaten into the substance of the shell, and left a slightly discolored pock-mark. The markings of the eggs seemed to be pretty well fixed, with the exception of the Falconidae—Duck Hawk, Pigeon Hawk and Sparrow Hawk—and some of the more highly pigmented seabirds, —Murres, Razor-billed Auk and the like, on which great care had to be used not to rub off the color.

After cleaning the eggs, I washed each of them with grain alcohol, in the hope that this might kill any of the growth or spores that might remain, and then after thorough drying, put them away in airtight cases, the apparently uninfected eggs in one, for further observation; and the infected eggs in another; and kept them all away from my own collection, which had always been spotless.

Having necessarily by this time become very much interested in the problem, I sent a few specimens during the autumn of 1916 to the Bureau of Biological Survey, Washington, D. C.; and was informed by them, after they had submitted the specimens to experts in the Bureau of Plant Industry, that the growth was a fungus, a species of penicillium "grown on albumen left on the surface of the eggs at the time they were blown," and that the color of the spots was probably due to dirt having accumulated at those points. It was thought that all the eggs needed was a thorough cleaning, and it was wisely suggested that I scrub the eggs with a solution of mercuric chloride, commonly known as corrosive sublimate, 1 to 500, dry thoroughly, and then keep them in a dry place, as "unless the egg is kept in a very damp place, there appears to be no danger of continued growth of the fungus."

Now I am no cryptogamist, and there doubtless were spots of penicillium growing on some kind of organic matter on those parti-

¹ I can recommend Bon Ami soap for anything of this sort; mould, dirt or even ink spots being, in most cases, readily removed by it.

cular eggs which I sent the Biological Survey—they were a few my friend had acquired by exchange, Seabirds, Murres, Cormorants, etc. and we all know what they may look like,—but inasmuch as my friend who had made the collection had always taken scrupulous care in blowing, cleaning, and rinsing his personally taken specimens, which were apparently just as badly infected as the Murres' and Cormorants' eggs; and had kept them in a specially built and practically dust-proof cabinet, in a dry place, it did not seem to me that the penicillium could be the cause of all the trouble. The coloring of the tawny spots seemed not to be due to dirt, and the spots themselves were too evenly distributed, not centered about the blow-holes, and on shells that appeared perfectly clean. They had also flourished in too dry an atmosphere to fit the diagnosis.

Illness prevented my treating the collection with mercuric chloride at this time; but as I had cleaned the eggs pretty thoroughly, and washed them with grain alcohol, and put them in a dry, place as advised, I hoped that perhaps no further treatment might be necessary.

A part of my collection is kept on the best quality absorbent cotton in pasteboard trays, in drawers in airtight metal cases; while those sets that were collected with their nests, are kept in specially made glass-topped pasteboard boxes, airtight, bug, fungus and fool-proof; and all in the third story in my house, dry, warm and well ventilated at all seasons; and I had previously never had any trouble of any sort.

During the ensuing months I inspected the eggs from time to time; and after a year or so found, to my disgust, that minute spots of the tawny growth were reappearing; but it was not until the autumn of 1918 that I was able to examine the collection again carefully with a glass. I then found that the growth, though apparently very slow of development, had started up again on about thirty per cent of the previously infected sets; and what was worse, had begun to show itself also on about twenty per cent of those that I had thought were uninfected; and this on specimens that had all been cleaned, as well as it was mechanically possible, of all albumen, dirt, or whatever else the growth was supposed to live upon. Evidently I had locked into these cases, in the cotton or

elsewhere, and in spite of all the pains I had taken, enough spores to perpetuate the trouble.

I cleaned them all again with Bon Ami soap, having again to remark a large number of the specimens; and then gave them all a bath, as prescribed by the Biological Survey, in a solution of mercuric chloride, one to five hundred; submerging them for from ten to twenty minutes according to the size of the eggs and the toughness of their shells; and then after rinsing them in fresh water, submerged them in another bath of fresh water for another period of from ten to twenty minutes, in order to be sure that none of the solution might remain inside, in such strength as to cause discoloration later about the blow-holes, which I was told might occur on improperly washed eggs when exposed to the light. As a matter of fact out of 1250 eggs, only one later showed a slight discoloration.

As I have never found the trouble on the inside of the shell, except in a very few exceptional cases immediately around the inner edge of the blow-holes, I figured that if the eggs were totally submerged, holes down, the solution would be sure to press up into the blow-holes far enough to reach all the trouble.

I used a series of enamel iron pans, deep enough to submerge the largest eggs, a number at a time, without overflowing; and I kept the eggs submerged by means of floating wooden covers, fitted to the pans, and weighted down sufficiently with small blocks of wood, so as to keep the eggs properly beneath the surface. I handled the eggs in the solution with surgeon's rubber gloves, and as was to be expected, lost a few of the more delicate specimens. A Warbler's egg, that has been taken in an advanced stage of incubation, does not take kindly to such heroic treatment, even in water; and too long continued a bath seemed to weaken a few of them perceptibly.

After blowing all of them that contained any appreciable amount of the water in which they had last been rinsed, I placed them, holes down, on clean absorbent cotton for twenty-four hours; and then placed them, holes up, in trays in an open cabinet, to the front of which I applied an electric heater for another twenty-four hours, to insure their being absolutely dry. I then placed them on clean cotton,—the best sterilized absorbent,—in clean trays, in clean

drawers, previously washed with mercuric chloride, in similarly treated cases; and though I have watched them carefully to date—August 12, 1920—have been unable to discover any recurrence of the trouble.

In order to find out how widespread the trouble might be, and under just what conditions it was most apt to occur, I communicated either personally or by letter, with a number of ornithologists throughout the United States and Canada. Of these, sixty-four either owned or had charge of egg collections, and twenty-six or over forty per cent, had had more or less experience with foreign growths of some sort on their eggs, while thirteen of these, or about twenty per cent, had had their collections seriously affected. Four had acquired collections with infected eggs, but had gotten rid of the trouble with comparative ease; and nine had only had isolated cases from which the trouble never seemed to spread. Personally, I believe, that if examined carefully, a majority of the collections would have been found to have contained a few infected eggs. The tawny growth seems to have been the cause of most of the trouble, as only a few had had much experience with commoner forms of mould.

One of the best known of our oölogists writes me that "the mould or fungus you refer to is, aside from the dermestes, the only thing the oölogist has to contend with, except light and dampness," and an ornithologist of international reputation writes me "as regarding the fungus that attacks eggs, I can only say that my collection is being destroyed by it, and I do not know how to stop it."

I saw a collection the other day, and I know of a number similarly affected, which had been stored in an airtight "Cambridge can" in a friend's warm, dry attic for a number of years. It was a collection that had been made and kept with a great deal of care, but which had become infected in some way with the tawny growth, and absolutely ruined by it.

With regard to the conditions under which the various collections were kept, I find that of the twenty-six infected collections, the thirteen in which the trouble never became serious were all kept in warm, dry, and comparatively well ventilated rooms; while of the thirteen that were seriously infected, a majority were kept under questionable conditions, in rooms that were cold and damp

and ill-ventilated, at least during certain seasons of the year, and four were kept under supposedly favorable conditions. Yet two of these last, kept in airtight metal cases, in warm, dry attics, were the worst infected collections that came to my notice. It may be only a coincidence, but in a number of collections the growth seemed to have spread also to the cotton on which the eggs were placed, and each time on cotton of inferior quality.

Of the thirty-six collections that were reported uninfected, twenty were kept in rooms that were apparently well aired and dry, three were kept in rooms that were damp, unheated, or closed, at least a part of the year; while thirteen of my correspondents failed to describe the conditions under which their collections were kept.

Most of my correspondents thought the cause of the trouble was dampness, particularly at certain seasons of the year; a number added "dirt;" and two or three laid all the trouble to the "small hole crank" who does not blow or rinse his eggs properly; while nearly all those that had been free from the trouble, were quite sure that their particular method of keeping collections was responsible for that freedom; and one or two enthusiasts were equally sure that they owed that freedom to the salubrious climate in which they lived. As a matter of fact, I found that the growth occurred there, just as elsewhere, and may apparently occur anywhere.

Among the numerous remedies suggested were, cleaning with warm water, ordinary soap, Bon Ami soap, Sapolio, heat, moth-balls, fumigation with bisulphide of carbon or with formaldehyde candles, or with dishes of formaline in each cabinet; immersion in salt water or gasoline; poisoning the interior of the egg with a weak solution of copper sulphate; treating the eggs with solutions of formaldehyde, peroxide of iron, bicarbonate of soda, carbolic acid, acetone, mercuric chloride, and izal. It was also recommended that unslaked lime or calcium chloride be kept in dishes in cabinets to absorb undue moisture; and one of our foremost scientists, while not believing in moth-balls as a remedy, was inclined to believe that they might possibly act as a deterrent.

Of the specimens that seem most apt to be attacked, one well known collector writes "smooth, plain eggs, notably duck eggs,

are affected, but also white eggs, such as owls, wood-peckers, kingfishers."

Another writes that "the Raptores are the favorite eggs attacked;" while still another writes "the glossy eggs are seldom affected unless very dirty; soft-shelled eggs with roughly or finely granulated surfaces are most seriously affected, e. g. my Gadwalls, Phoebe's and Swallows' eggs show the highest percentage."

In my own case the growth seemed to be pretty generally distributed, but the eggs of grouse and gallinules were worst affected, while the Raptores were practically free. As a matter of fact, I find, after looking over a number of infected collections, that the growth seems entirely impartial in its tastes, and those eggs which happen to be within reach of the point of infection, may become infected, apparently regardless of color or texture.

After duly assembling, tabulating, and endeavoring to digest all the above seemingly rather contradictory data, in the spring of 1919, feeling quite sure I had permanently cured the trouble in my collection, and being more curious than ever as to the cause thereof, I asked Prof. S. C. Prescott of the Massachusetts Institute of Technology to investigate the cause of the trouble; and to suggest, if he could, some better method of getting rid of it. That which I had adopted was clumsy and bothersome and was hard on the more fragile eggs, because of the repeated handling and necessary re-marking, and I wanted, if possible, to discover some method of fumigating, as with carbon bisulphide, formaldehyde or something of the sort, which would be convenient for all collectors.

While Prof. Prescott was not able to give all the time and attention to the problem he would have liked, his investigations were carried on for a number of months, during which a large number of eggs were examined, from a number of infected collections, and from which there were obtained numerous cultures for a long series of tests.

Under date of July 31, 1920 Prof. Prescott writes as follows:

"Repeated examination of the infected birds' eggs has shown that the discoloration appears to be due to a large spore-forming bacillus which develops brownish colonies very slowly on the external surface. It is possibly an undescribed species, although cultures and microscopic appearances are so close to the potato bacillus that there can be no doubt

as to the group to which it belongs, and I have classified it provisionally as a variant of the *Bacillus mesentericus fuscus*. Occasional eggs show also the presence of fungi, but the main cause of the trouble appears to be the bacillus. This organism grows even in rooms which are very low in humidity, and may therefore appear in what would be dry chambers. While treatment with corrosive sublimate or other strong disinfectant-solutions is troublesome and time-consuming, and the ideal method of disinfection of large collections would be by use of gaseous disinfectants such as formaldehyde, the high resistance of the spores makes the fumigation of the eggs by formaldehyde or other gaseous disinfectants uncertain, as the destruction may not be complete and successful. If spores are not destroyed, they may possibly develop later with slight changes in the atmospheric conditions. We are, therefore, at this time unable to recommend any easier procedure than treatment with solutions of corrosive sublimate which appear to be effective. A treatment of five or ten minutes with a 1 to 1000 solution will probably be sufficient to destroy the infection and prevent further developments."

To summarize, it appears from the evidence obtained, that specimens should not only be thoroughly blown, rinsed, and cleansed of all organic matter when added to one's collection; but should be kept in dry, well ventilated rooms in dust-proof cases. Under such conditions, ordinary moulds, "mucor, aspergillus, penicillium, eurotium, and a few less common forms," all of which were found and isolated by Prof. Prescott, are little to be feared, and are controlled with comparative ease.

On the other hand, the tawny bacillus mesentericus fuscus, though slow of growth, seems when once introduced, to spread under just such conditions; to grow upon the surface of the shell itself, which it may injure; and to be particularly difficult to eliminate; confinement in airtight cases in a dry place seeming at times to aid in its development.

To recapitulate regarding treatment; upon discovery of the trouble, all sets of infected eggs, and when possible, all those that have been exposed to infection, should be cleaned, when necessary, with Bon Ami soap, applied with an old linen handkerchief, or soft rag of some sort. Particular pains should be taken at this time to re-mark with great care, all eggs from which the set-number has been erased during cleaning, and it is right here that the casualties are most apt to occur.

Then the eggs should be totally submerged, blow-holes down,

in a solution of mercuric chloride, 1 to 500. Get the ordinary commercial white tablets from your druggist, and dissolve 4 to the quart of water, in glass or enamel iron pans or dishes of some sort, not susceptible to the action of mercuric chloride, and deep enough to submerge the largest of the infected eggs.

Since treating the collection, we have found by further experimenting with cultures in the laboratory, that a submergence of one and a half minutes in mercuric chloride, 1 to 500 will kill the spore-bearing bacteria. Under the less favorable home conditions, it seems to me that a submergence of from three to five minutes, according to size and texture of the egg should not only be ample time to kill all bacteria, but can do no harm to the shell itself.

After this bath, the eggs should be rinsed in running, or frequently changed water, and then again submerged, in a bath of fresh water, for a period of from 5 to 10 minutes according to the size and texture of the eggs.

When there are a number of eggs to be treated, surgeon's rubber gloves may be used, and several sets of pans, in order to facilitate handling, as well as to insure against mixing the eggs. I never place two sets of the same kind, or even similar eggs, in the same bath at the same time.

After this bath, blow out any water that may remain in the eggs, then wipe carefully, and place, blowholes down, on a sheet of absorbent cotton for 24 hours or until drained; then turn, and place holes up for another 24 hours, in a warm dry room, and if possible, help the drying-out process with a little extra gentle heat, as for instance, an electric reflector or something of the sort.

When the eggs are put away in the cabinet, particular care should be used to see that whatever material they are placed on, as well as the trays or drawers they may be placed in, are absolutely clean, and free from all possible previous contamination by the fungi or bacteria. A few spores inadvertently left on the cotton or sawdust, or whatever medium is used, may bring on an exceedingly unwelcome recurrence of the trouble.

I got rid of it with infinite pains, as described above; and while I realize that my method was far from ideal, it certainly was effective, even though Prof. Prescott seems to think the solution

stronger than necessary; and as such I offer it to my fellow-sufferers, until some equally sure but more convenient method may be devised.

With at least two out of every five collections more or less infected, and at least one out of every five seriously affected by the trouble, and with specimens constantly being exchanged between collectors, the situation seems to demand attention.

After this all eggs received by me from doubtful sources will be quarantined and treated with corrosive sublimate. Eternal vigilance should be the price paid by those that do much exchanging; and unless some better method of treating the infected collection is devised, those collectors who really value their eggs, should keep their sets either in tight glass topped drawers, or better still in individual, spore-proof, glass topped paste board boxes¹, where the accidental introduction of an infected set can do little harm. The private collections of the late William Brewster, Messrs. John E. Thayer, John Lewis Childs, and a number of others that I know of, are kept in this way. It seems to me the only way for museum collections, where eggs generally fail to get the loving care they do from individuals; and the sooner the rest of us adopt this method, the sooner we may be able to control or check the spread of the disease. It is the ideal way of keeping eggs; and while it may cost a little more money, it is certainly worth while. When one thinks of all the money one spends on collecting trips, and in the general rounding up of specimens, the extra cost of such boxes is hardly worth considering.

Some three months after the above paper had been sent to the Editor, I chanced, while attending the meeting of the A. O. U. at Washington, D. C., to foregather with Mr. J. H. Riley of the U. S. National Museum, and from him learned of a method of cleaning eggs, which had been used successfully at the Museum sometime prior to 1903, when Mr. Riley had treated a number of infected eggs, upon which there seems to have been no recurrence of the trouble.

¹ Beautiful boxes of this sort are made to order in sizes desired, by the Dennison Manufacturing Co., 26 Franklin St., Boston, Mass.

Chlorinated soda and "Javelle Water," which is chlorinated potash, seem to have been used impartially and with equal success. Both are strong bleaching agents commonly used as disinfectants, in the removal of mildew, etc., and in museums for the cleaning and bleaching of bones. The use of these chemicals for the cleaning of eggs, was confided to Mr. Riley by Dr. W. L. Ralph, who succeeded Major Bendire as custodian of birds eggs at the U. S. National Museum. Mr. Riley writes that "Dr. Ralph always maintained that the use of this solution on eggs was his secret, and would never let me tell of its use, but as he is dead now [he died in 1907] you can make any use of the knowledge of this preparation you have a mind to. In fact I think its use should be more generally known."

With regard to method of treatment, Mr. Riley writes as follows: "Pour some of the liquid into a shallow china saucer, or other earthen vessel, then if eggs are to be cleaned, dampen an old linen handkerchief, and carefully wipe the spot to be cleaned, and note the action. When the stain has been removed, thoroughly wash the egg in clean water, and allow to dry. Care should be taken with pigmented eggs, but white eggs need not be watched so closely."

. . . "I should not think of trying to clean pigmented eggs without the greatest care, and as follows: Barely have the cloth damp with the solution, and have a basin of clear water right at hand. Then lightly touch the spot to be cleaned with the damp cloth, and lightly brush it. On the first sign of bleaching, or when the stain is removed, thoroughly wash in clean water."

. . . "Eggs so badly nest stained that the markings could not be seen at all, I have cleaned so nicely that you would never know that they had been stained at all."

Mr. Riley writes further that "This solution can also be used in removing embryos from badly incubated eggs. Introduce it into the egg with a syringe. I have left it overnight in a large egg. You will have to experiment to find out how long to leave it in an egg, as it varies with condition and size of egg, of course."

Prof. Prescott and I have since done considerable experimenting, with both the Chlorinated soda and Javelle Water; and while they certainly proved to do all that Mr. Riley said they would, I should hesitate to recommend them for general use, at least so far as the removing of spore-bearing bacteria is concerned.

Both chemicals act very quickly upon the shell itself, unless diluted with four parts water, and even then should be used with the greatest care, especially on what may be called surface-pigmented eggs. In addition to the risk attached to this method of treatment, the mere wiping of eggs can hardly be as thorough as a total submergence, (it is difficult for instance to wipe around the inside of the blow-hole); and as we find that, under favorable laboratory conditions, it takes chlorinated soda, one to four parts water even longer to kill the spore-bearing bacteria than it does corrosive sublimate, a submergence of pigmented eggs long enough to be affective is apt to injure both texture and markings. Bon Ami soap and warm water will be found, in most cases, to be just as affective, so far as the actual cleaning of the shell is concerned, and far less dangerous.

While we had no eggs with embryos, on which to experiment, the use of these chemicals in softening up membranes and other matter that might remain inside the shells, was truly remarkable. A solution of one part chlorinated soda and four parts water, shaken up in an egg, would quickly soften any remaining membrane; but small eggs left over night showed a distinct deterioration, the chemical having eaten its way through, and leaked out of some of the smaller ones, while eggs even as large as Spotted Sandpiper's became very fragile.

If I had a few large unspotted eggs that needed cleaning I might try Dr. Ralph's method, but in any other case, it seems to me that treatment with corrosive sublimate is, in comparison, not only safer, but better in every way.

Thanks are due to the many ornithologists, oölogists, members of the Biological Survey, Mr. Riley and others, and to Professor Prescott in particular, who have, with considerable patience helped me in this investigation.

Dudley Road, Newton Centre, Mass.

NOTES ON A COLLECTION OF ACCIPITRES FROM
THE MERIDA DISTRICT, W. VENEZUELA.

BY H. KIRKE SWANN, F. Z. S., M. B. O. U., C. F. A. O. U.

THE collection forming the substance of the present paper was received from Venezuela, through the instrumentality of Mr. W. F. H. Rosenberg, in June of 1920, and comprises the *Accipitres* collected in the years immediately preceding the war by Bricéno Gabaldon e Hijos, of Mérida, and I have added a small selection of skins from the same source previously received. The total number of skins is 140, referable to 24 forms, of some of which very good series are presented. The numbers prefixed are those of my "Synopsis."

1. *Vultur gryphus gryphus* (LINN.), S. N., i, p. 86 (1758) [Chile] ♀ (?) near Mérida, circa 1912 (ticket perished).

An example in the brown plumage, without any sign of caruncle or wattles, wing 830 mm., indicating a size above the average. The species is probably not common from Venezuela, but the British Museum collection contains one other skin, female in the black and white plumage, from the same locality, with the wing 798 mm. An Ecuador female in same plumage which I have examined had the wing 786 mm., and a large male from the Andes, 798 mm., an immature male in brown plumage, 808 mm.

51a. *Climacocerus zonothorax* CAB., J. f. O 1865, p. 406 [Porto Cabello, Venez.]

3 ♂ 3 ♀ Montana Sierra. Valle and Chama, 1906-11, alt. 2000-3000 meters; ♂ Limoues, September 15, 1906, alt. 700 m. All in more or less immature plumage. One male is in first plumage with buff underparts, the other birds all being in various stages of barring. The wide bars fairly well spaced suffice to distinguish this species from *C. guerilla* and it is certain that *C. zonothorax* is the species most common in Venezuela. It generally shows at all stages a well-defined white collar on hind neck, and the head is blackish brown; the throat white with a brown zone on foreneck. An example stated to be the rufous phase of this species in the British Museum collection from Venezuela (Spence) is in my opinion a rufous phase of *C. guerilla* and not this species as may be seen by the close and fine barring below and by the uniform head, hind neck and throat.

105. *Accipiter collaris* (KAUP) MS. in Mus. Brit. undé; Scl. Ibis 1860, p. 148, pl. 6. [New Granada-Bogota].

One immature Mérida dist. circa 1913 (orig. label perished).

I append a description of this example of this very rare hawk as it differs greatly from the Bogota juvenile described and figured by Sclater (*cf. supra*) although it agrees very well with an immature bird from the same district in the British Museum collection. The size of the feet and claws prove this bird to belong to the genus *Astur* rather than *Accipiter*. The only previous examples known to me are the two in the British Museum collection and one at Norwich.

Head and nape deep blackish chocolate, nape with a concealed white spot: above, including wings, chestnut red, clearer on the tail, which is crossed by 6 narrow black bands; throat whitish; below paler chestnut, the sides of the chest and flanks banded with darker chestnut; under wing-coverts pale chestnut; inner webs of primaries and secondaries banded with black; tibial plumes deep chestnut red, with traces of dusky bars. Total length about 265 mm.; wing 162 mm.; tail 127 mm.: culmen, including cere, 18 mm., tarsus, 40 mm., middle toe without claw 35 mm., middle claw 13 mm., outer claw 9 mm., inner and hind claws 22 mm.

(112a.) *Accipiter chionogaster venezuelensis* subsp. nov.

♀ (?) Escorial, Mérida dist. Feb. 17 1911, 2500 meters, in coll. H. Kirke Swann; and ♀ Escorial, Sept. 10 1896, Tring Mus. coll.

Type. Escorial, Mérida dist. 2500 meters, February 17, 1911. Coll. H. Kirke Swann.

Characters.—This new subspecies agrees well with the typical form from Guatemala, in the snowy white underparts, with only a few faint hair-lines on chest, but the tibiae are rather more rusty whitish coloured, although far paler than in *A. salvini*, and are faintly marked with dusky cross-bars: above it differs from the typical form in the much paler slate-gray shade, especially on the head, which is black in the typical form; the dark tail bands are wider and the pale interspaces narrower. Wing 196-198 mm. (in Guatemala female wing averages 208, male 172 mm.) The cotype in the Tring Museum differs only in the absence of the faint crossbars on the tibial plumes.

113. *Accipiter salvini* (Ridgw.) Bull. U. S. Geol. Surv. ii, p. 121 (1876). [Mérida, Venezuela].

3 ♀ Escorial, ♀ Montanas Conefos, ♀ Blechitera, ♂ Valle, juv. ♂ Montanas Valle, 2000-2500 meters.

The juvenile in this species has the lower parts rather whiter, the stripes paler, narrower and more longitudinal than in *A. ventralis*, with no apparent bar.

114. *Accipiter ventralis ventralis* SCLAT. P. Z. S. 1866, p. 303. [Interior of Colombia].

2 ♀, 2 ♂ Valle, ♂ ♀ Escorial, 2 juv. ♂ Valle, 1904-11, alt. 1500-3000 meters.

None of the adults are in quite uniform rufous plumage below, the most adult female having the rufous of chest and breast broken by white spots

or bars. One male, however, has rufous of under parts more nearly uniform but under tail-coverts white.

Anad. Culata, August 19, 1912, alt. 3000 meters, I doubtfully refer to this species, which it resembles above, although the black tail bands are wider and the gray interspaces narrower; below the rufous is paler and the chest uniform ashy gray. One other such example from the same district is in the British Museum collection.

123. *Accipiter bicolor* (VIEILL.), N. Dict., x. p. 325 (1817) [Cayenne].

Ad. ♀ Culata, March 11, 1908, alt. 2,500 meters.

128. *Heterospizias meridionalis meridionalis* (LATH.), Ind. Orn. i, p. 36 (1790). [Cayenne.]

No examples in the collection from Venezuela, although several from there are in the Tring Museum and British Museum collections. I find on examination that the northern (typical) form is smaller than examples I have received from Argentine, while the latter differ considerably in plumage, showing little or no trace of gray above. I therefore propose to separate the Argentine birds under the name of —

128a. *Heterospizias meridionalis australis* subsp. nov.,

♂ Laguna de Malima, Tucuman, Argentina, March 31, 1902, coll. Dinelli, in coll. H. Kirke Swann; ♀ Tucuman, May 23, 1900, coll. Dinelli, in coll. Tring Mus.

Type. ♂ Laguna de Malima, Tucuman, Argentina, March 31, 1902, coll. Dinelli. ♀ In coll. H. Kirke Swann.

Characters.—Larger and much darker above than typical form; mantle and scapulars blackish brown with rufous margins in place of pale slate grey with rufous margins; below averaging darker and with the dark bars wider and more numerous.

Wing in male (type and cotype) 415–17 mm., female (Tring Museum) 430 mm., against 386–404 mm. in Venezuelan male, 398–417 mm. in Venezuelan female, 405 mm. in Guiana female, 398 mm. in Bolivian male, 390 mm. in Brazilian (Matto Grosso) male, all the latter being typical birds.

129. *Geranoaetus melanoleucus* (VIEILL.) N. Dict. d'Hist. Nat., XXXII, p. 57 (1819). [Paraguay.]

4 ad. ♂, 2 juv. ♂, 2 juv. ♀, 2 nestlings, Culata, Escorial, Paramos de Morro, Paramo Escorial, Nevada, alt. 2500–3000 meters, January to October, 1907–12.

These examples appear to be a trifle smaller in size than Patagonian birds. Wing, male, 455–468 mm., tail 215–227 mm., wing, female, 480–525 mm., tail 252–303 mm.

Three of the juvenile birds have the tail slate gray numerously barred with black, while the fourth has already acquired the uniform black tail; all have the chest bright ochre. Of the two nestlings, one is in white down, with only the dark feathers of the wings and tail appearing and a few rufous feathers on sides of breast; the other is nearly fledged, with nearly all the rufous ochre chest-feathers and the white down only left in

patches, chiefly on the throat, chest, thighs and under side of wing; the feathers appearing on the latter and on the abdomen are black, instead of rufous barred with black as in the immature dress.

146. *Buteo platypterus platypterus* (VIEILL.), Tabl. Ency. Meth. iii. p. 1273 (1823) [near Philadelphia].

8 ♂, 5 ♀, 4 juv. ♂, 1 juv. ♀, Valle, Escorial, Culata, Conejos, Epelo. Nevados, Jufi, Aug. 14 to March 15, 1903-13, alt. 1200-3000 meters. Presumably the Venezuela birds are all migratory and there are no examples taken between March 15 and August 14.

147. *Buteo abbreviatus abbreviatus* CAB., in Schomb. Reis. Guiana, iii. p. 739 (1848) [Brit. Guiana].

I have received from Dr. Reichnow some particulars of Cabanis' type of *B. abbreviatus* now in the Berlin Museum, as well as a drawing of the outer tail-feather, which leave no doubt that Cabanis' species is a tenable one and corresponds with the "nearly adult (type of *B. albonotatus*)" of Sharpe (Cat. Bds. B. M. p. 163) now in the British Museum collection. Therefore *B. albonotatus* as resuscitated by Mr. Sclater in that collection must drop as being a synonym of *B. abbreviatus*, while the birds referred to *B. abbreviatus* must be regarded as black examples of *B. albicaudatus*. One juvenile bird from Guiana in my collection, described under No. 152 b., as well as a similar juvenile referred to *B. abbreviatus* in the Tring collection represent apparently the first juvenile stage of *B. albicaudatus*, a species which starts very dark and lightens with maturity.

Melanism in the South American Buzzards is in fact frequent. The form known as *B. unicolor* and so designated in the Tring Museum, I believe is correctly to be referred to *B. erythronotus*. The black birds from Venezuela, Guiana, etc., with the tail resembling *B. albicaudatus*, either adult immature, are I believe nothing more than melanistic of *B. albicaudatus*.

I take this opportunity of stating that further examination of this difficult question convinces me that the bird I described (Synoptical List p. 51, No. 147a, 1919) as *Buteo abbreviatus minimus* is, from its size, a melanistic example of *Buteola brachyura* and not a small form of *B. abbreviatus* as I previously supposed, especially as *B. abbreviatus* is itself a large edition in appearance of *Buteola brachyura* (= *B. fuliginosa* Sclater) in which the tail is marked exactly as in the younger examples of *Buteo abbreviatus*.

I give a brief description of the type of Gray's *B. albonotatus*: Male (?) from Mexico, ex coll. J. Taylor. which Sharpe correctly designated as the younger of the two plumages: Blackish above and below, with more or less concealed white spots, especially on the under surface; the nape feathers white, except at tips, showing conspicuously; tail with about 6 ashy brown bars (appearing white below) the black bars narrow, except the terminal one which is 28 mm. wide; primaries below with narrow bands

of blackish brown, the wide interspaces ashy white; under wing and tail-coverts black; wing (measured as usual on underside) 405, tail 215, tarsus 75. middle toe without claw, 45 mm.; first 4 primaries notched.

The adult plumage, correctly described by Sharpe, as exhibited by Mexican examples, shows none of the white spots above and below, but white of nape is still exhibited; the tail has one broad median band of lighter grey, with a second narrower one nearer base, both showing very white below. Intermediate stages of plumage exhibit 5 and 4 of the ashy brown bands showing that they reduce with maturity, the subterminal one widening correspondingly. A male from Surinam in the Tring collection has four ashy brown bars above, but six white ones below; wing 385 mm. The inner face of primaries appears more slate colour in adults. Other Mexican male birds in the British Museum collection have the wing 392-400 mm. Two Mexican male examples in the Tring Museum have the wing 405 and 419 mm. There is no female in the British Museum collection, but one in the Tring collection from Bolivia has the wing 450 mm. A male from Peru in the British Museum collection has a wing of 380 mm.

152b. *Buteo albicaudatus exiguus* CHAPM., Bull. Am. Mus. N. H. XXXIV, p. 637 (1915). [Barrigon. Colombia.]

1 imm., Montañas Morro, May 29, 1911, alt. 1500 meters. In immature plumage, wing 411 mm. On account of its small size the example is presumably referable to this form.

I possess also a more juvenile male from British Guiana, February, 1898, ex coll. W. S. L. Loat. Above brownish black with white bases to feathers of head and interscapular regions; feathers of rump browner, with white bases and buff margins; sides of rump and upper tail-coverts white; tail feathers ashy brown, with narrow, indistinct, darker bars, the inner webs whitish; below buff, heavily marked with black, especially on chest and sides of breast; inner face of wing quills grayish, banded with black; wing 305 mm. (not fully grown.) This juvenile bird so closely suggests the blackish immature birds of *B. albicaudatus* that I do not hesitate to refer it to this species. A similar bird in the Tring Museum is referred to *B. abbreviatus*.

155. *Buteola brachyura* (VIEILL.) N. Dist. d'Hist. Nat., IV., p. 477 (1816). [Cayenne.]

♀ (? , marked ♂) Escorial, August 18, 1913, alt. 3000 meters. In adult plumage, blackish above with four broad black bands on tail; sides of chest black, with some light brown lower margins: the rest of under parts pure white; wing 316 mm.

2 ♂ Valle, June 15, 1911, November 20, 1913, alt. 2500 meters. Both in immature plumage; buff below, the first with a very few dark striations on sides, the second with rufous edgings to feathers of upper parts, tail with nine narrow, dark bars, hardly apparent above; wing 290 and 298 mm.

♀ Escorial, October 28, 1911, alt. 2800 meters. Like first of the immature plumages above; wing 335 mm.

♀ Monte Sierra, April 18, 1911, alt. 3000 meters. Like the second of the immature plumages above; wing 323 mm. These immature plumages show very little black on sides of chest.

♀ juv. Culata, August 15, 1911, alt. 3000 meters. With the under parts buffish white chest marked with longitudinal blackish stripes and lower breast heavily blotched across with blackish brown; tail more visibly barred; wing 316 mm. One such example is in the British Museum and one in the Tring Museum and I therefore refer it to this species; and must suppose it to be the most juvenile plumage, as the buff under parts are evidently succeeded by the white plumage.

158. *Eupornis magnirostris magnirostris* (GMEL.) S. N. i. p. 282 (1788). [Cayenne].

11 ad., 3 immature, Valle, Culata and Escorial, June to December, 1907-11, alt. 2000-3000 meters; 1 nestling, Valle, July 12, 1908, alt. 2000 meters.

Wing 208 mm. (smallest male)—232 mm. (largest female). If the birds with largest wing measurement are females (sexing being questionable) they are much less rufous below than male birds. The immature birds have the feathers edged with buff above; and the chest buff with longitudinal blotches of brown; tail with four instead of three bars of black; otherwise they differ little from the adults.

The nestling (a newly fledged bird) is in similar plumage to the immature birds, even to the tail, which however is only just growing; the cross barring of under parts is also present as in the adults.

Birds from northern Ecuador in my collection do not agree with Venezuelan or Guianan birds, but the individual variation is so great that I do not think they can be separated. An example from Vaquerio, N. Ecuador, shows a strong tinge of rufous in the tail and of buff on upper tail-coverts and has the secondaries as well as primaries rufous on inner webs, but a second example from the same region has no buff on upper tail-coverts and no rufous in tail (cf. Chapman, Bull. Am. Mus. N. H. XXXVI, p. 244, 1917). Both these birds are almost as pale grey above as typical examples but a male from Chauchamayo, Peru, has the upper parts very much browner, yet has no rufous in tail or secondaries, nor yet any buff on upper tail-coverts. Bangs' form *occidua* from Rio Tempopata, E. Peru, is distinguished solely by having the chest "bright cinnamon rufous" instead of gray, but Peruvian birds from other districts do not show this.

A pair of birds in the Tring Museum from Chimbo, Ecuador, lack the buff on upper tail-coverts. The male has the light tail bands strongly rufescent, especially on anterior and posterior edges; the female however has no visible rufousness on the tail.

159. *Eupornis leucorrhoa* (QUOY ET GAIM.) Voy. de l'Uran. p. 91, pl. 13 (1824). [Brazil.]

♂ Culata, October 20, 1913, alt. 3000 meters; ♂ ♀ Montanas Sierra July 11, 1911, December 14, 1910, alt. 2500 meters; 2 ♂ Escorial, September 18, 1911, September 15, 1913, alt. 3000 meters. One ♂, apparently scarcely mature, shows a little buff variation below and very little rufous on the tibial plumes.

193. *Lophotriorchis isidorei* (DES MURS), Rev. Zool., 1845, p. 177. [Santa Fé de Bogota.]

♂ ♀ (?) Mérida, circa 1912 (orig. tickets perished). In immature plumage, head and neck white with darker centers to the feathers; short crest black; entire underparts white, with a few dark brown shaft-lines; tail with 4 black bands, the wide interspaces marked with gray and brown; wing of a female (?) 521 mm.; male (?) 488 mm. Tring Museum possesses three examples in this plumage, one of which has the rufous feathers of adult plumage appearing on side of chest.

238a. *Elanoides forficatus yetapa* BONN. ET VIEILL., Encyc. Meth. iii, p. 1205 (1823). [Paraguay.]

5 ♂, 4 ♀, Culata, Capás, Escorial, April–August, 1906–14, alt. 2500–3500 meters; 1 juv. Correfos, June 19, 1911, alt. 3000 meters.

The adults of this scarcely separable form seem to average a trifle smaller than those of the typical form; wing 373 mm. (smallest male) to 433 mm. (largest female). The juvenile bird appears to be newly fledged, with the tail just growing, the head and hind neck buff, and underparts washed with buff; the plumage otherwise not differing from that of the adult.

246. *Rogerhinus uncinatus uncinatus* (TEMN.), Pl. Col. i, pl. 103–5 (1824). [Brazil=Rio de Janeiro, apud Chubb, type in Leyden Mus.]

♂ juv., Escorial, October 12, 1911, alt. 3000 meters. ♂ in intermediate plumage, Mérida dist. (ticket perished). The juvenile bird is in very rufous plumage, the secondaries entirely rufous barred with black.

250b. *Elanus axillaris leucurus* (VIEILL.) N. D., XX, p. 563 [err. 566] (1818). [Paraguay.]

♂ Nevada, Nov. 14, 1905, alt. 3000 meters.

252. *Gampsonyx swainsoni meridensis* SWANN, Synop., List Accip., pt. 3, p. 104. January 20, 1920. [Nevada, Merida dist. Venez. type in coll. H. K. S.]

♂ (type) Nevada, November 15, 1903, alt. 3000 meters.

8 ♂, 1 ♀, Valle 1905–13, alt. 2000–2500 meters.

Three ♂ are younger examples, having the feathers of upper parts edged with rufous, the rufous collar nearly absent and the forehead white, but not otherwise differing from the adults. All examples show the rufous on sides characterising this race although in varying degrees.

Two examples in my collection from Bona Vista and Miritiba, N. E. Brazil are intermediate showing a trace of rufous on the left flank only.

253. *Ictinia plumbea* (GMEL.) S. N. i p. 283 (1788). [ex Lath.-Cayenne.]

1 juv. Nebados, Sept. 18, 1912, 3000 meters.

Juvenile plumage: slaty black above the head, neck, throat and chest white, streaked with slaty black, the flanks barred with the same.

293. *Falco deiroleucus* TEMM., Pl. Col. i, pl. 348 (1825). [Brazil.]

Juv., near Mérida, November, 1911. In the immature plumage described by Sharpe (Cat. Bds. Brit. Mus., p. 403). Wing 289 mm., hence presumably a female.

297. *Falco columbarius columbarius* LINN., S. N., i. p. 90 (1758) ["America", ex. Catesby=Carolina].

♂ Culata, September 18, 1911, alt. 3000 meters.

310a. *Cerchneis isabellina ochracea* COVEY, Field Mus. Pub. Orn., Ser i. p. 298 (1915). [Colon, Tachira, W. Venez., type in Field Museum.]

19 ad. ♂; 1 ad. ♀; 9 juv. 1906-14.

One ad. male, with totally unspotted back and lower parts, shows a small rufous crown patch; another practically adult, but with back barred has a larger rufous crown patch.

315a. *Pandion haliaetus carolinensis* GMEL., S. N. i. p. 263 (1789) [S. Carolina.]

♀ Culata, March 14, 1908, alt. 2500 meters.

♂ (?) Montanas Sierra, October 24, 1911, alt. 2800 meters.

The female, apparently less adult, lacks the narrow paler edgings above which appear in the other bird, and has upper parts, including the center of crown and patch behind eye and a distinct occipital crest, blackish; the tail dark brown with distinct bands of black; the interspaces on all but center pair of feathers white; wing 494 mm.

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DESCRIPTION OF A NEW LOON.

BY LOUIS B. BISHOP M. D.

WHEN I returned from North Dakota in 1895 I was surprised to find that a breeding female Loon I had collected on Turtle Mountain was much smaller than any I had from the East. Later, when I obtained eggs from North Dakota, I found them also smaller than eggs I had collected in New Hampshire. Unsexed Loons, killed by half-breeds on Turtle Mountain also in 1895, and now in the collection of Mr. William H. Hoyt, were likewise very small, as was another breeding female I collected there in July, 1905.

Difficulties arose, however, in determining whether the larger or smaller bird was true *immer*. Brünnich, in describing *Colymbus Immer* (*Ornithologia Borealis*, 1764, p. 38), had evidently a young bird or one in winter plumage, which he said came from the Faroe Islands (E *Færoa*), and gave the range as these islands, Norway and Iceland. Under *Colymbus Torquatus* he describes the adult (page 41), and ascribes it to Iceland, Greenland and Norway. I failed to find skins of this species from any of these localities in any collection to which I had access. Later I obtained an adult male taken in south Greenland on June 2, and adult females taken in south Greenland on May 28 and in Iceland on July 23. Comparison showed at once that the North Dakota birds were much smaller than these.

Then another trouble presented itself. Adult Loons in breeding plumage, for it seemed safer to confine comparison to such birds, are by no means common in collections, and a large part of the existing skins are of undetermined sex. In studying the subject I have examined and measured all the adult Loons of this species in the Museum of Comparative Zoology in Cambridge, the Bangs Collection in that Museum, the American Museum of Natural History in New York, the California Academy of Sciences, the Museum of Vertebrate Zoology at the University of California, the private collections of the late Mr. William Brewster, Dr. Jonathan Dwight, Captain A. Henry Higginson and Mr. William H. Hoyt, and some in the Biological Survey collection in the United States National Museum, and wish to express my thanks to those in charge of these collections for allowing me this privilege.

The measurements of these birds, when tabulated, showed clearly that two races exist. The much larger bird, true *immer*, breeds in Iceland, Greenland, and south along the Atlantic coast of North America to New Hampshire and western New York; west along the Arctic coast to Fort Macpherson, Mackenzie; south-west through Yukon (Forty Mile) to the Kenai Peninsula and Admiralty Island, Alaska. At least birds referable to it have been taken at these places from the latter half of May to August. It winters along the Atlantic coast, south at least to North Carolina, and on the Pacific to Port Townsend, Washington.

Of the smaller race I have examined late spring and summer

adults from Wisconsin, Minnesota, North Dakota (7) and Sicamous, British Columbia. It winters commonly on the coast of California, all the California birds I have examined belonging to it, and north to Oregon. It is rare or accidental in winter on the Atlantic coast from Maine south to Florida.

A male in the Museum of Comparative Zoology (37377) taken in Massachusetts, but without date, an immature female in the collection of Mr. Brewster (4125) taken at Concord, Mass., on April 9, 1875, and a male in the American Museum of Natural History (74967) taken at Matanzas River in August, 1879, plainly belong to the smaller form, as does the young Loon from Maine in the Newell Eddy collection, now in the Museum of Yale University, which has been recorded as *Gavia arctica*. (Knight, Birds of Maine, 1908, p. 27). To this race belong also a female taken on the Colorado River, California, April 4, 1864, in the Museum of Vertebrate Zoology, (6403), and a bird from the Kennerly Expedition in the collection of Dr. Dwight (21982).

The only reference to the existence of two forms of the Common Loon that I have found is in the 'Catalogue of the Birds of New Brunswick,' where Mr. Chamberlain states (Bull. Nat. Hist. Soc. New Brunswick, 1, 1882, p. 63) "Two races of Loon spend the summer in New Brunswick, and breed here. They have plumage of similar colors and markings, but one is smaller than the other, being some six inches less in length." The larger bird he gives as the form breeding abundantly in the interior, not seeking the coast till the rivers freeze over, while the smaller he finds the commoner in the Gulf of Saint Lawrence, but gives no proof that it breeds there. Two of three birds in the collection of Dr. Dwight from Tadousac, Quebec, are intermediate between the two races, and probably the smaller one does occur in the Gulf in fall.

It is a common summer resident of the lakes and ponds on Turtle Mountain, North Dakota. In notes and habits it resembles the larger race.

As the names *immer*, *torquatus* and *glacialis* all apply to the larger race the smaller one may be known as

***Gavia immer elasson*¹ new subspecies**

Lesser Black-billed Loon²

Type.—Female adult No. 13235 collection of Louis B. Bishop; Carpenter Lake, Rolette County, North Dakota, July 13, 1905; L. B. B., collector.

Subspecific characters.—Smaller than *Gavia immer immer*

Summer range.—The interior of North America from Northern California, North Dakota, northern Iowa and Wisconsin, north to British Columbia, and probably northern Manitoba and northern Ontario.

Winter range.—Chiefly the coast of California, north to Oregon, and south to Lower California; the Gulf of Mexico (?); rarely on the Atlantic coast from Maine to Florida.

Measurements of type.—Length, 743 millimetres; extent, 1327.2; wing, 352; tail, 76.7; exposed culmen, 71.1; depth of bill at base, 21.3; tarsus, 77.5; outer toe with nail, 110.5.

This Loon is a common summer resident of the lakes and larger sloughs on Turtle Mountain. Two eggs in my collection were taken on Fish Lake by Edstrom on June 15, 1902, and we saw downy young at Carpenter Lake on July 13, 1905. It is a common migrant on the prairie lakes, arriving soon after the middle of April (Rock Lake, April 18, 1895; Sweetwater, April 17, 1903, Bowman), and breeds on Devil's Lake, where young a few days old were seen on June 9, 1895, (Bryant), and possibly occasionally at Stump Lake, as two were seen there between June 3 and 10, 1903, (Baily and Hughes), and a single bird on June 17 and 26, 1905, (Eastgate and Bishop).

The diving ability of the downy young we learned at Carpenter Lake July 15, 1905, where two with their parents were seen well toward the center of this deep and almost circular body of water. The day was clear and calm, with no waves to hide the birds. Soon after our boat began to gain on them the old birds dove, coming up far apart, and leaving the young in almost the center of the lake. Then the young dove also, and, though we soon reached the spot where they disappeared, and watched on all sides carefully for a long time, we never caught another glimpse of either.

¹ From the Greek comparative ἐλάσσων meaning "smaller." As a Latin adjective all genders are *elasson*.

² That the English name of a bird should be sufficiently definite that no doubt will exist as to what species is meant, when it is used, seems to me very necessary. "Loon" belongs also to all the other members of the genus, "Northern" is a misnomer, and "Common" unsatisfactory. The name "Black-billed" is simple and fairly distinctive, so I offer it as a suggestion.

Measurements of Loons from various localities follow. They are in millimetres, taken with dividers except the wing, which was taken with a steel tape following the natural contour.

GAVIA IMMER IMMER

	Wing.	Tail.	Exposed Culmen.	Depth of Bill at Base.	Tarsus.	Outer Toe with Nail.
Eight breeding males from Alaska, Greenland, Labrador, Newfoundland, Quebec, Massachusetts and Alexandria Bay, New York.						
Average..	388.3	90.5	84.	26.5	98.3	127.1
Largest...	406.4	101.6	93.7	29.3	99.1	146.1
Smallest..	362.	81.8	73.4	23.1	82.3	117.3
Nine breeding females from Alaska, Yukon, Iceland, Greenland, Labrador and Maine.						
Average..	381.3	90.3	80.6	25.1	91.3	124.
Largest...	392.4	100.1	90.4	28.2	98.6	134.6
Smallest..	349.3	82.	75.	22.4	81.8	113.
Four non-breeding males from Massachusetts, Rhode Island and Connecticut.						
Average..	376.6	88.7	87.5	27.	90.	119.4
Largest...	396.2	96.	95.8	29.4	96.	129.5
Smallest..	363.	85.1	83.6	24.1	81.3	115.1
Six non-breeding females from Connecticut, New York, North Carolina and Washington. (The three from Long Island, New York, taken two in May and one in December, have wings nearer the smaller race, but bills and feet nearer the larger.)						
Average..	361.4	84.2	85.3	25.3	93.9	121.8
Largest...	372.9	89.2	99.1	27.4	100.6	126.
Smallest..	335.3	77.5	75.4	23.6	89.4	116.3
Nine adults of undetermined sex from Mackenzie, Maine, Massachusetts and Sable Island, Nova Scotia.						
Average..	380.2	87.5	87.2	27.4	92.	125.5
Largest...	406.4	100.1	92.5	30.	98.6	135.1
Smallest..	357.	81.5	82.6	24.	83.	110.

GAVIA IMMER ELASSON

Wing.	Tail.	Exposed Culmen.	Depth of Bill at Base.	Tarsus.	Outer Toe with Nail.
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Three breeding males from Minnesota and North Dakota.

Average..	354.4	80.4	81.5	23.9	85.5	116.9
Largest...	361.3	86.4	85.2	25.2	91.2	121.1
Smallest..	342.	74.6	75.	22.3	80.4	111.8

Five breeding females from Wisconsin, North Dakota and Sicamous, British Columbia.

Average..	345.7	81.3	73.9	21.8	80.6	109.6
Largest...	359.7	91.3	78.2	22.9	83.6	111.7
Smallest..	333.3	70.6	68.2	21.2	77.5	106.7

Two breeding birds from North Dakota of undetermined sex.

339.	81.2	76.3	22.6	88.	111.
357.	97.8	....	22.9	83.7	107.8

Three non-breeding males from the coast of California.

Average..	343.	83.5	78.	24.3	91.8	121.4
Largest...	347.	98.8	79.8	24.8	98.6	124.9
Smallest..	337.	65.3	76.8	23.9	85.3	115.3

Four non-breeding females from the coast of California, and the Colorado River.

Average..	337.5	90.5	74.9	22.4	83.2	112.1
Largest...	345.	106.	76.2	23.1	84.7	115.1
Smallest..	331.	82.8	73.	21.4	80.8	109.6

Three adults of undetermined sex from Oregon and the coast of California.

Average..	332.3	85.3	72.3	22.7	82.6	114.7
Largest...	351.8	99.5	76.1	23.4	88.7	116.4
Smallest..	315.	70.5	69.3	21.5	79.	113.8

A not-dated Male and immature Female taken April 9 from Massachusetts, and an unsexed adult taken at Matanzas River, Florida, in August.

Average..	346.9	81.3	77.	22.9	86.3	117.5
Largest...	355.6	85.3	77.7	23.6	88.4	120.6
Smallest..	342.9	76.7	76.2	21.8	83.8	114.3

Length and spread of wings of the two races are as follows, taken in millimeters, from freshly killed birds.

GAVIA IMMER IMMER

One Male and three Females from Connecticut, North Carolina and Washington.

	Length	Extent
Average.....	834.9	1435.3
Largest.....	866.6	1479.6
Smallest.....	812.8	1381.6

GAVIA IMMER ELASSON

Three Males and four Females from North Dakota and California.

Average.....	751.6	1330.1
Largest.....	787.	1371.6
Smallest.....	715.8	1290.6

Measurements of eggs, of the two forms in millimeters are

GAVIA IMMER IMMER

Four (two sets) from southern New Hampshire.

	Length	Breadth
Average.....	90.7	57.2
Greatest.....	91.7	57.7
Least.....	88.9	53.9

GAVIA IMMER ELASSON

Six (three sets) from Turtle Mountain, North Dakota.

Average.....	81.	55.1
Greatest.....	82.6	56.9
Least.....	78.8	53.6

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NOTES ON THE WINTER AND EARLY SPRING BIRDS OF SOUTHEASTERN ARKANSAS.

BY CHRESWELL J. HUNT.

Acre after acre of flooded woodland; a Turkey Buzzard soaring overhead; mud, mud everywhere and a woodpecker on every tree. That is my impression of winter in southeastern Arkansas.

The early part of 1920—January 24 to April 12—was spent in a construction camp in the northeastern corner of Drew County, Ark., living in a tent in the woods and spending all of my time

out-of-doors. During these eleven weeks I inspected the mixing and laying of eight miles of asphalt road which kept me fairly busy, but as this work kept me out-of-doors and as there were days off when the work was held up for one cause or another I managed to explore the locality quite thoroughly. Then too our road was bordered on one side by an interesting cypress bayou and on the other by open cotton fields and was in itself a good place for bird study. As there has been so little published on the birds of Arkansas it seems advisable to place on record what observations I made on the birds of this section. My thanks are due Mr. Benjamin T. Gault of Chicago for much assistance in the preparation and examination of specimens.

The camp was situated along the Missouri Pacific tracks, two miles north of Tillar, Drew County, about fifteen miles west of the Mississippi River, the character of the country being low and flat—land that was, prior to the building of levees along the Mississippi, under water annually during the freshet season. According to Mr. Arthur H. Howell in his 'Birds of Arkansas'¹ it lies in the lower Austral life zone. East of the camp, in Deshea County, near the river, is a stretch of really wild country where Wild Turkeys are plentiful, deer common and a few black bears and bobcats are still to be found. I should have liked to have explored some of those swamps but as my time was not my own and as the few Missouri Pacific trains always ran the right way at the wrong time, I found it practically impossible to make any extended side trips and had to confine my tramps afield to within walking distance of the camp. In this section the land is mostly owned by large estates, much of which is heavily wooded. The cleared portion is divided into small farms which are rented to negro tenants who plant and raise a crop of cotton. The white owners mostly live in the towns; hence there are few big plantation homes through the country, only the small houses of negro farmers scattered about. In this section "cotton is king" and some corn is grown; but most of the country is covered with a forest of hardwood, largely oak (I identified eight species of oak from the brown leaves underfoot), hickory and elm, white walnut,

¹ *Birds of Arkansas*, by Arthur H. Howell, 1911, Bulletin No. 38, Biological Survey, U. S. Department of Agriculture.

ash, sycamore, red and silver maple are common. Trees characteristic of the locality are the holly, china-berry, pecan, and sweet gum and along the streams the bald cypress and the tupelo gum.

To me it was a land of woodpeckers, especially during January and February, for while there were many other birds about, the woodpeckers, or "Peckerwoods" as they call them in Arkansas, were I believe the most abundant and I know they were the most conspicuous and noisy of them all. The Red-headed and Red-bellied Woodpeckers were my almost constant companions all day long. Practically every tree and fence-post had its "Peckerwood." They were even on the trees beside the dirty asphalt plant with its black smoke and noise. I really wish I could make it plain how abundant Red-headed Woodpeckers were about Tillar. To say they were extremely abundant does not begin to fill the bill. Every Red-head has his own special perch where he sits by the hour, sallying forth now and then after some insect in true flycatcher fashion, and he drives away any other bird that dares come near his favorite tree top. He is a noisy bird too with a variety of calls but is not given to drumming nearly as much as are the Red-bellied, Hairy and Downy.

As I recall those winter woods, with the warm vivid sunlight, there is always a Red-headed Woodpecker somewhere in the picture. Perhaps the immense flocks of Grackles and Rusty Blackbirds, that wandered about, were more of a novelty;—flocks of thousands, drifting through the woods and covering the ground in the half dry spots; but as you tramped through those woods there were ever Red-headed Woodpeckers about you, alighting on the tree trunk at your side, calling from the branches overhead or fluttering down from above like wounded birds, the white patches on their wings resembling scraps of paper blown before a wind. Then too these winter woods were by no means songless. There was the cheery whistle of the Carolina Wren and the Cardinal; White-throated Sparrows sang off and on; Tufted Titmice called, Blue Jays screamed and Mockingbirds scolded. Small flocks of quiet Robins darted about and Bluebirds were frequently seen. The Carolina Chickadee was everywhere and flocks of Goldfinches roamed here and there. Also one came upon an

occasional Phoebe, Hermit Thrush and Brown Thrasher, or a few Ruby-crowned Kinglets or Myrtle Warblers. Out in the open fields the Meadowlarks sang and you flushed coveys of Bobwhites and small flocks of Mourning Doves. Also there were Field, Vesper and Song Sparrows. Shrikes perched on the wire fences and above circled the Turkey Buzzards and Black Vultures or an occasional Red-shouldered Hawk. The absence of Crows was remarkable. I heard one on January 27 but I did not see or hear them again until April 7 when I saw several.

January 31 was warm, the elm trees were budding out and the little cricket frogs were singing all day and night. A Screech Owl was heard calling, which was the only Screech Owl heard in Arkansas.

February 1 the Mockingbird started to sing. By the 5th the red maples were in blossom and on the 8th there was a decided migration of Brown Thrashers and Robins in progress. On the 9th Killdeers were calling and a Red-winged Blackbird sang for the first time.

February 12 I saw the first Fox Sparrow and Sparrow Hawk. The Robins and Bluebirds were more plentiful and noisy than formerly. You now found the Robins scattered about the woods instead of in occasional flocks. Juncos and White-throated Sparrows were singing and Cardinals were to be seen everywhere. The farmers were starting to plow the cotton fields.

February 18 I found a little lake surrounded by a fringe of tall cypress and grown up in the center with a regular cattail marsh. In these southern marshes the brown cattails and marsh grasses of last year are standing just as tall and almost as thick as they were last summer, there being no ice and snow to break them down as happens farther north. From out of this marsh came the "Ka-ka-ka-ka" of Rails or Gallinules and the "Coo-coo-coo" notes of the Pied-billed Grebe. I saw six of the Greebes but nothing of the authors of those other mysterious noises and there was not a boat to be found about the pond.

I went to Little Rock on February 19 and while there visited the State Capitol and called on the Hon. Dick Brundage, Chief Game Warden. The State of Arkansas makes no provision for scientific collecting and they had written me, when I applied

for a permit, that they did not care to grant permits. So I took the matter up in person with the Chief Warden who gave me a special permit. But while the State has such rigid game laws I found that down in the southeastern corner these laws are not enforced and anyone who wants to shoot anything just takes his gun and shoots it.

On February 23 I found violets and spring beauties (*Claytonia*) in blossom and the peach buds were beginning to open. There are none of the cold set-backs to spring in Arkansas that we experience farther north. One day it is winter and you awake the next morning to find that spring has arrived. A flush of new green leaves on the woods; the rich black earth in the newly-plowed fields; a blossoming peach tree with a Mockingbird singing from its midst; that is March in southeastern Arkansas. On the morning of March 1 there was a regular sparrow chorus in the thickets, the Mockingbirds were heard all day long, and Bewick's Wrens were singing. On March 7 there was a decided migration of Swamp Sparrows and Hermit Thrushes in progress and the peach trees were in full bloom.

March 17 there were great numbers of ducks and geese on the lakes over near the Mississippi but I was unable to see this vast congress of migrating water fowl. March 18 Bobwhites were calling and the Judas trees (*Cercis*) were in blossom. In the evening the first bats came out, while the Robins had apparently all gone north.

March 25 the Yellow-throated Vireo arrived. There were great numbers of butterflies about the woods and I noticed the Red Admiral and the big Tiger Swallowtail. In the bayous the turtles were out sunning themselves on every available log. The sassafras trees were in blossom and yellow buttercups studded the railroad banks. A pair of Bluebirds were building a nest. The flowering dogwood was just coming into bloom and the red plumes of the buckeye (*Æsculus*) brightened the woods. The bald cypress was putting out little feathery leaves and the sweet gums were spreading their bright green stars. The young locust leaves were good to look at. Spring beauties covered the ground in places and May apples were in blossom.

The Chimney Swift arrived March 26; the Purple Martin March

29; and on March 31 the Parula Warbler, Solitary Sandpiper, White-eyed Vireo, Cowbird and Chipping Sparrow put in an appearance. Then on April 1 came the Ruby-throated Hummingbird, Blue-gray Gnatcatcher and Red-eyed Vireo. The Scarlet Tanager, Great Crested Flycatcher and Yellow Warbler arrived April 5 and on the 6th the Cerulean Warbler, Black-throated Green Warbler, Black and White Warbler and Wood Pewee reached us. The Summer Tanager arrived April 7 and the Maryland Yellowthroat and Redstart on April 8. To one who has watched the spring arrivals in our northern states there were several surprises in this Mississippi bottom-land migration. Here on April 10 the woods were alive with warblers and yet, save for two Purple Martins, not a swallow had been seen. Also here were Wood Thrushes, Red-eyed Vireos and Scarlet Tanagers but not a Catbird or a House Wren to be found anywhere.

April 11, my last day a-field, the country had much the appearance of mid-May in northern Illinois: the flowering dogwood and the apple trees were in full bloom, the Kentucky Warbler, Warbling Vireo and Prothonotary Warbler arrived, I came upon a clump of blossoming buckeye and darting about it were a full dozen male Ruby-throated Hummingbirds. They would fly at each other uttering a sort of little scolding note. Over the trees above drooped a poison oak vine loaded with its trumpet-like flowers. Never before had I seen so many Hummingbirds at one time and I will make that my last picture of Arkansas; the bright plumes of the Buckeye; the gorgeous yellow and red trumpets of the Poison Oak and a dozen darting Ruby-throats.

LIST OF BIRDS OBSERVED ABOUT TYLLAR, ARKANSAS

January 24—April 12, 1920

1. *Podilymbus podiceps*. PIED-BILLED GREEBE.—Mr. Arthur H. Howell in his 'Birds of Arkansas', calls this a rare breeder. It is said locally to be a common breeder. Six were seen on February 18. It was observed again on March 26 and March 27.

2. *Phalacrocorax auritus auritus*. DOUBLE-CRESTED CORMORANT.—A flock of eight seen flying over March 22.

3. *Anas platyrhynchos*.—MALLARD.—Howell gives the Mallard as an abundant winter resident and says that numbers are found until the middle of April, but makes no mention of its nesting. This duck was seen several times during March and on April 1 a nest was found on an

old cypress stump in the bayou near Winchester. The man who found this nest hatched the ten eggs under a hen. These eggs hatched April 7 and I saw the downy young on April 11—four days old. I also examined the nest, a down-lined hollow in the decayed top of the stump. After examining young Mallard skins I have no doubt that those little ducks were young Mallards.

4. *Querquedula discors*. BLUE-WINGED TEAL.—Two males observed on the Bayou near Winchester, April 11.

5. *Aix sponsa*. WOOD DUCK.—Howell calls this "The commonest of its family in both winter and summer," but gives no nesting records. I observed this bird on February 3 and again on April 3. On April 4 one of the men from the camp found a female Wood Duck taking her brood of thirteen youngsters to the water. They were crossing the railroad tracks when he saw them and he managed to capture ten of the little ducks. The mother tried by faking a broken wing and such stunts to divert his attention from the young birds but finding her efforts fruitless she flew away. He brought the ten little ducks to camp and fixed up a box for them. They were apparently but a day or two old as the egg sack had not yet been absorbed. They were very interesting babies. They kept up an incessant peeping. They had quite a claw on each toe and could climb up the side of a box as quickly as a mouse, using both bill and claws. They could also swim and dive and it was remarkable what a small hole they could squeeze through. Two days later they all died, chilled I believe, and are now in Chicago collections.

6. *Branta canadensis canadensis*. CANADA GOOSE.—Howell states that a few pair remain to breed in the most secluded parts of the Sunken Lands. I observed a small flock in March and am assured by residents that wild geese sometimes nest in this locality.

7. *Ardea herodias herodias*. GREAT BLUE HERON.—This bird was observed on February 8, March 6, March 14, and April 7.

8. *Fulica americana*. COOT.—Several seen February 12 and again seen March 27.

9. *Philohela minor*. WOODCOCK.—A pair observed March 21.

10. *Gallinago delicata*. WILSON'S SNIPE.—Common. Frequently flushed from wet spots while crossing fields.

11. *Helodromas solitarius solitarius*. SOLITARY SANDPIPER.—One of these birds observed March 31 around a small pool in the woods.

12. *Actitis macularia*. SPOTTED SANDPIPER.—Arrived March 17.

13. *Oxyechus vociferus*. KILLDEER.—First noted February 9. Seen frequently after that date.

14. *Colinus virginianus virginianus*. BOBWITE.—Common. Would flush one or two coveys on every tramp afield.

15. *Meleagris gallopavo silvestris*. WILD TURKEY.—Still said to be common in the wild country near Arkansas City. On March 14 I saw a gunner entering McGehee, Deshea Co., with one he had taken that morn-

ing. They are said to be sold all winter in the McGehee market and are brought in in lots of ten or twelve.

16. *Zenaidura macroura carolinensis*. MOURNING DOVE.—Abundant. During January and February I found them mostly in small flocks about the cotton fields but during March they became generally distributed. Nests found April 3 and April 9, females incubating.

17. *Cathartes aura septentrionalis*. TURKEY VULTURE.—Abundant. Seen everywhere and at all times.

18. *Catharista urubu*. BLACK VULTURE.—Abundant. Perhaps a little less so than the Turkey Buzzard. The two species frequently seen together.

19. *Accipiter velox*. SHARP-SHINNED HAWK.—One observed on April 6.

20. *Accipiter cooperi*. COOPER'S HAWK.—This bird was seen January 25 and again February 24. A pair were found nesting on April 3.

21. *Buteo lineatus lineatus*. RED-SHOULDERED HAWK.—Common about the camp woods. The birds were paired and apparently nesting about April 1 though I discovered no nests.

22. *Falco columbarius columbarius*. PIGEON HAWK.—One observed February 8.

23. *Falco sparverius sparverius*. SPARROW HAWK.—First seen on February 11 but became fairly common after that date.

24. *Strix varia alleni*. FLORIDA BARRED OWL.—Barred Owls were common at all times about the camp woods. Were heard calling day and night. From what Howell says in his report I class them as the southern form though no specimens were taken.

25. *Otus asio* subsp. ?. SCREECH OWL.—One heard calling the evening of January 31 which was the only Screech Owl noted during my stay in Arkansas.

26. *Bubo virginianus virginianus*. GREAT HORNED OWL.—Heard calling February 18, March 11, March 14, and March 23.

27. *Ceryle alcyon alcyon*. BELTED KINGFISHER.—Tolerably common. Known by the negroes as "Fish Hawk."

28. *Dryobates villosus villosus*. HAIRY WOODPECKER.—Hairy Woodpeckers were tolerably common during February and one taken February 3 proved to be *villosus*.

29. *Dryobates villosus auduboni*. SOUTHERN HAIRY WOODPECKER.—After March 1 Hairy Woodpeckers were not nearly so common and I believe all seen were *auduboni*.

30. *Dryobates pubescens pubescens*. SOUTHERN DOWNY WOODPECKER.—The little Downy Woodpecker was common at all times. One male was taken April 3.

31. *Dryobates pubescens medianus*. DOWNY WOODPECKER.—Howell states that this sub-species has only been taken at one locality in the state, Van Buren, where 6 specimens were secured by Mr. G. Dal-

las Hanna between November 29 and January 7. I took a male *medianus* on February 3.

32. *Sphyrapicus varius varius*. YELLOW-BELLIED SAPSUCKER.—Common. Specimens taken February 3 and April 7. On March 17 there was a decided migration of Sapsuckers in progress.

33. *Phloeotomus pileatus pileatus*. PILEATED WOODPECKER.—Known locally as "Lord God" and "Wood God." Said to be common in the cypress swamps. I saw the bird but twice, February 16 and 23.

34. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.—Abundant everywhere. I believe the Red-headed Woodpecker or "Peck-erwood" as they call it in Arkansas was the most abundant and noisy species seen.

35. *Centurus carolinus*. RED-BELLIED WOODPECKER.—Abundant everywhere; but less so than the former species. A pair taken March 6. A sociable and noisy bird.

36. *Colaptes auratus auratus*. FLICKER.—Common.

37. *Chaetura pelagica*. CHIMNEY SWIFT.—Arrived March 26. Were common April 6.

38. *Archilochus colubris*. RUBY-THROATED HUMMINGBIRD.—Arrived April 1 and were about in numbers April 11. A specimen taken April 11.

39. *Myiarchus crinitus*. CRESTED FLYCATCHER.—Arrived April 5 when two were seen and one taken.

40. *Sayornis phoebe*. PHOEBE.—Tolerably common during January, February, and March, becoming less so about April 1. Were silent before March 6 when I heard the first one calling. Specimen taken April 7.

41. *Myiochanes virens*. WOOD PEWEE.—Arrived April 6 and again heard calling on the 7th. These were the only birds noted.

42. *Cyanocitta cristata cristata*. BLUE JAY.—Abundant. Specimens taken.

43. *Corvus brachyrhynchos brachyrhynchos*. CROW.—I heard one on January 27 and several were seen on April 7. These are my only Arkansas records.

44. *Molothrus ater ater*. COWBIRD.—Arrived March 31 and seen in small numbers during the rest of my stay.

45. *Agelaius phoeniceus phoeniceus*. RED-WINGED BLACKBIRD.—Common.

46. *Sturnella magna* subsp. ? MEADOWLARK.—Common and in song during my entire stay.

47. *Euphagus carolinus*. RUSTY BLACKBIRD.—Abundant. Flocks of hundreds drifting about the woods. One collected March 6.

48. *Quiscalus quiscula aeneus*. BRONZED GRACKLE.—One of the most abundant birds. Flocks of thousands about the woods and flying over toward their roosts at evening. A pair taken March 3.

49. *Passer domesticus domesticus*. ENGLISH SPARROW.—Common in the towns and a few seen about the barns and houses through the country.

50. *Astragalinus tristis tristis*. GOLDFINCH.—Common.

51. *Poocetes gramineus gramineus*. VESPER SPARROW.—A small flock seen on February 8. Also saw an occasional bird but they were not common.

52. *Chondestes grammacus* subsp.? LARK SPARROW.—A single bird seen January 26.

53. *Zonotrichia albicollis*. WHITE-THROATED SPARROW.—Abundant everywhere during my entire stay.

54. *Spizella passerina passerina*. CHIPPING SPARROW.—Arrived March 31. Common during balance of my stay.

55. *Spizella pusilla pusilla*. FIELD SPARROW.—Common in small flocks about the cotton fields. Frequently heard singing after February 23.

56. *Junco hyemalis hyemalis*. SLATE-COLORED JUNCO.—Abundant. In the flooded woods they kept up in the tops of the trees. On April 3 I shot one which I mistook for a warbler. This bird was moving actively about among the new leaves in the top of a tall tree apparently catching insects. They were still about April 11.

57. *Melospiza melodia melodia*. SONG SPARROW.—Tolerably common up to April 3 but not seen after that date. First heard singing February 18.

58. *Melospiza georgiana*. SWAMP SPARROW.—A few seen during February. March 5 there was a decided migration and by March 7 they had become common. They were still about and singing April 11.

59. *Passerella iliaca iliaca*. FOX SPARROW.—This bird was first seen February 12 and on February 23 I saw quite a flock of them.

60. *Pipilo erythrophthalmus erythrophthalmus*. TOWHEE.—Common up to February 15 when there was a decided influx of them and after that date an abundant species.

61. *Cardinalis cardinalis cardinalis*. CARDINAL.—One of the most abundant birds and heard singing at all times. Two specimens taken. Two nests found April 8 with females incubating three and four eggs.

62. *Piranga erythromelas*. SCARLET TANAGER.—Arrived April 5. Two specimens were taken April 6.

63. *Piranga rubra rubra*. SUMMER TANAGER.—Arrived April 7 and first heard singing about the camp. Two specimens taken.

64. *Progne subis subis*. PURPLE MARTIN.—Arrived March 29. Seen again on March 30. I saw only these two birds and they were the only swallows seen in Arkansas.

65. *Bombycilla cedrorum*. CEDAR WAXWING.—A flock of eight seen April 7 one of which was collected.

66. *Lanius ludovicianus migrans*. MIGRANT SHRIKE.—Shrikes were common throughout my stay. Specimen taken March 31.

67. *Vireosylva olivacea*. RED-EYED VIREO.—Arrived April 1. Specimen taken April 5 at which time they were common and singing everywhere.

68. *Vireosylva gilva gilva*. WARBLING VIREO.—Howell says: "The only record of the species in Arkansas is from Helena where it is reported by Mrs. Stephenson as a common summer resident." I saw and heard one singing near Winchester April 11.

69. *Lanivireo flavifrons*. YELLOW-THROATED VIREO.—Arrived March 25 and specimen taken on that date. A common species from then on.

70. *Vireo griseus griseus*. WHITE-EYED VIREO.—Arrived March 31. Specimen taken April 1. Tolerably common after April 1.

71. *Mniotilta varia*. BLACK AND WHITE WARBLER.—Arrived April 6 but heard only once after that date.

72. *Protonotaria citrea*. PROTHONOTARY WARBLER.—First seen near Winchester April 11.

73. *Compsothlypis americana raimalinae*. WESTERN PARULA WARBLER.—Arrived March 31. Three specimens taken.

74. *Dendroica aestiva aestiva*. YELLOW WARBLER.—Arrived April 5. Seen only once.

75. *Dendroica coronata*. MYRTLE WARBLER.—A tolerably common winter resident. On March 7 there was a decided migration. Specimens taken March 25 and April 5. They were still about April 11.

76. *Dendroica cerulea*. CERULEAN WARBLER.—Arrived April 6. One taken April 8.

77. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.—Arrived April 6. Two males taken both in winter plumage.

78. *Oporornis formosus*. KENTUCKY WARBLER.—One heard singing April 11.

79. *Geothlypis trichas trichas*. MARYLAND YELLOW-THROAT.—Arrived April 8 and became common April 9.

80. *Wilsonia citrina*. HOODED WARBLER.—Arrived April 5.

81. *Setophaga ruticilla*. REDSTART.—Arrived April 8.

82. *Anthus rubescens*. PIPIT.—A single bird flushed from a cotton field February 5 and a flock of twenty seen south of McGehee, Deshea Co., on March 14. These may have been *spraguei*.

83. *Mimus polyglottos polyglottos*. MOCKINGBIRD.—Abundant everywhere—in the woods; about the houses and gardens; on the fences along the roadside and in the road itself. First heard singing February 2. I found two completed nests April 7 but no eggs had been laid up to April 11.

84. *Toxostoma rufum*. BROWN THRASHER.—An occasional bird seen up to February 8 when they became common and remained so until April 1 when the bulk seemed to have moved north. A few birds were still about April 11 when I left. It seemed remarkable that I never heard a Brown Thrasher sing in Arkansas. In southern Louisiana, in 1918, I frequently heard them sing during February.

85. *Thryothorus ludovicianus ludovicianus*. CAROLINA WREN.—Common and singing at all times. A specimen taken March 5.

86. *Thryomanes bewicki bewicki*. BEWICK'S WREN.—Arrived February 25 and one collected on that date. Was heard singing and was seen at various localities during March but none were noted after April 1.

87. *Troglodytes aëdon aëdon*. HOUSE WREN.—I observed one bird exploring an old fence February 18. Howell gives but one winter record for the state.

88. *Nannus hiemalis hiemalis*. WINTER WREN.—One taken February 25. This was the only bird seen.

89. *Certhia familiaris americana*. BROWN CREEPER.—One seen February 10. March 25 they became common for a few days. Not seen after April 4.

90. *Sitta carolinensis carolinensis*. WHITE-BREADED NUTHATCH.—A tolerably common bird. Seen at numerous localities during my entire stay.

91. *Baeolophus bicolor*. TUFTED TITMOUSE.—One of the most abundant birds. Its cheery whistle heard everywhere.

92. *Pantheotes carolinensis carolinensis*. CAROLINA CHICKADEE.—Abundant.

93. *Regulus calendula calendula*. RUBY-CROWNED KINGLET.—An occasional kinglet seen during January and February. February 15 they became much more common and were about in numbers and singing when I left Arkansas April 12.

94. *Polioptila caerulea caerulea*. BLUE-GRAY GNATCATCHER.—First seen and specimen taken April 1. Were common April 7.

95. *Hylocichla mustelina*. WOOD THRUSH.—Arrived April 3. Were common and singing April 11.

96. *Hylocichla guttata pallasi*. HERMIT THRUSH.—About in small numbers during January and February. March 7 they became common. Not noted after April 1.

97. *Planesticus migratorius migratorius*. ROBIN.—Common; roaming about in silent flocks through the winter woods. A migration took place February 8 and after that date they became abundant and noisy and generally distributed. March 18 they had apparently all departed north except one bird that continued to stay about the camp and was still there when I left April 12.

98. *Sialia sialis sialis*. BLUEBIRD.—Common during my entire stay. A pair were building a nest in an old stub March 25.

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THE MOCKINGBIRD IN THE BOSTON REGION AND
IN NEW ENGLAND AND CANADA.BY HORACE W. WRIGHT.¹

The purpose of this paper is to review recorded occurrences of the Mockingbird (*Mimus polyglottos polyglottos*) in New England from the earliest records to the present time and to indicate thereby a definite increase in its representation during the period covered, especially in more recent years. In Samuel's 'Birds of New England,' 1883, p. 168, originally published in 1867, it is stated of the Mockingbird, "This bird is so exceedingly rare in New England that it can scarcely be regarded otherwise than as an accidental visitor; and Massachusetts is certainly its northern limit." In a 'Key to North American Birds' by Elliott Coues, fifth edition, 1903, originally published in 1872, the range of the species is given as "The United States from Atlantic to Pacific, southerly; rarely north to New England, and not common north of 38°; though known to reach 42°". In 'A History of North American Birds' by Baird, Brewer, and Ridgway, 1905, originally published in 1874, it is stated, "The Mockingbird is distributed on the Atlantic coast from Massachusetts to Florida. It is by no means a common bird in New England, but instances of its breeding as far as Springfield, Mass., are of constant (?) occurrence, and a single individual was seen by Mr. Boardman near Calais, Maine." Minot in his 'Land Birds and Game Birds of New England,' 1876, states, "A very rare or almost accidental summer visitor to Southern New England." Mr. William Brewster in the revised edition of the work, 1895, states in a qualifying footnote to *Mimus polyglottos*, "A local and very uncommon, but probably quite regular summer resident of southern New England, seen oftenest on or near the coast. One or two specimens have been taken in

¹ This paper was completed by its author at the very time of his death, in June 1920. As a comprehensive and detailed review of the status of the Mockingbird at the northeastern bounds of its range, it is of special interest, but since in its original form it seemed rather too long for a general article in the already overcrowded pages of 'The Auk', it has been somewhat shortened by condensing the review of published records, to which the reader may be referred for fuller details if desired, and by omitting here and there certain less relevant passages. Otherwise it is substantially as it was left by its author.—G. M. Allen.

Massachusetts in winter." Mr. Brewster in his 'Birds of the Cambridge Region,' 1906, characterizes the Mockingbird as a "rare transient visitor in spring and autumn and very rare summer resident." The review will show, I think, that there has been in the last twenty years a notable increase of occurrence of winter resident birds extending even into Maine, as compared with the characterization of the Mockingbird by Mr. Brewster in 1906 as "a rare transie it visitor in spring and autumn," without mentioning winter residence, and by his footnote in 1895 stating, "One or two specimens have been taken in Massachusetts in winter," and that this increase in the northern limit of range of winter resident birds points to an increasing permanent residence of the Mockingbird in New England.

THE BOSTON REGION.

My own experience with the Mockingbird as a wild bird in the region of Boston dates from 1902, in which year one (1)¹ was observed on October 16 in a cemetery in Melrose. In 1903, a Mockingbird (2) was first seen in Landen's Lane in the Jamaica Plain district of Boston on February 26 and 27. This bird, presumably the same, moved into the Arnold Arboretum, in close proximity to the lane, in early March, and on April 21 was heard singing. In December of this year a Mockingbird (3) was seen at East Point in Nahant on the 28th day, and upon another trip there on January 30, a month later, was again observed in the same locality. This location was much exposed to winds from the ocean, and yet there was shrubbery enough to afford sufficient cover, apparently, to attract the bird to the spot. On the December date the record shows the temperature to have been almost stationery at 16° during the middle of the day, with fresh northwest winds. On the January date the minimum was 18° but on previous days of the month there had been minima of 5°, minus 1°, zero, and minus 6°, as Boston records of temperature. The mercury would certainly have fallen several degrees lower than these figures at Nahant, where the Mocker was wintering.

In 1904, a Mockingbird (4) was again seen in the Arboretum

¹ The figures in parentheses denote the succession of individuals observed.

on January 12, and on this date only. In the same year one (5) was observed in the park beside Jamaica Pond on January 6, 7, 13, 23, and February 1, and then was lost to our ken, but Messrs. F. G. and M. C. Blake recorded this bird as late as April 6. In December in the same locality, where had been Francis Parkman's suburban residence and rose garden in earlier years, a Mocker again appeared and was observed on the 19th and 23d of this month, and on January 2 following was seen on the Charles Sargent estate adjoining. Perhaps, these were different individuals, but they occupied so precisely the same portion of the park that it seems not improbably that the two occurrences should be regarded as those of the same individual. In both instances the bird was strictly a winter visitor, and, so far as my observation extended, sought other locations after January 2 and April 6 respectively. My weather record for the entire month of January 1904 is, "very cold and stormy; snowfall of the month thirty-six inches; sleighing uninterrupted." At the close of this year, namely, on December 23 and 26, again a Mockingbird (6) appeared in the Arboretum and became essentially a 1905 bird, for it continued to be observed on January 2, 16, 18, 24, February 2, 10, 22, and March 2, 7, 22, 31, after which it was no more recorded. On the later March dates no song had been heard. On February 2, however, the bird was in quite close proximity to a Northern Shrike, and both birds gave musical calls and whistles, the Shrike voicing itself rather the more variedly on this occasion. The record is that the two birds were within a hundred feet of each other on their respective perches in front of the administration building. Mr. Charles E. Faxon, whose fine, artistic work in illustrating Professor Sargent's 'The Silva of North America,' was done within this building, told me he had been puzzled over the identity of these two birds, for at one time he would see a Shrike and at another time a Mockingbird, but had failed to see both at the same time and clear up the mystery. Once more in December of this year a Mocker (7) appeared in the southerly section of the Sargent estate, near Jamaica Pond and was recorded on the 27th day, and once later on January 30, 1906, after which date the bird was not again seen.

Also in January, 1906, again a Mockingbird (8) was seen in Nahant on the 19th day, this occurrence being near the centre of

the town, where the peninsula is much wider than at East Point and there are more sheltered spots. No other individuals than these two January birds were recorded in 1906. Mrs. Edmund Bridge had observed this bird on December 20 preceding. No individuals appeared in the late autumn or early winter of this year in places which had now come to be associated with the Mockingbird as its winter haunts, namely, the Arboretum, and the park about Jamaica Pond and its immediate vicinity.

The year 1907 opened in the same way with no records of a Mockingbird in January, February or March. But in the fall, on November 8, one (9) was seen in the Fresh Pond Reservation, perching in shrubbery on the west side, while below on the ground an early Tree Sparrow was feeding. This bird was not again seen upon subsequent visits to the reservation.

During the entire winter of 1907-8, a Mockingbird (10) in West Medford was under observation by Mrs. Edmund Bridge. By her kindness I saw this bird on February 10. Mrs. Bridge states in 'The Auk,'¹ "From November 17, 1907, until April 20, 1908, we had a Mockingbird on our place the greater part of each day, with few exceptions, feeding on suet, barberries, and cedar berries. The bird, presumably a female, as it did not sing, scolded and drove away the Shrike, Jays, Cedarbirds, and Robins."

This was a winter when, according to my records, "Birds are very scarce. Land-birds are very noticeably absent, or present in the smallest numbers. Water-birds are also in diminished numbers, scarcely a species being as abundant as usual. Yet we have the White-winged Gulls in unusual number at the Lynne and Swampscot beaches and elsewhere, at least six Iceland, several Glaucous, and a Kumlien's." On the whole it was a rather mild winter with only five near-zero mornings occurring at the end of January and in early February.

In February, 1908, on a visit to Franklin Park on the 18th a Mockingbird (11) was observed there. And in April visits to the Park, two individuals (11, 12) were seen on the 14th and 22d. On the former date both birds were silent at the time of my visit, but on the latter date the two were seen several times together for a

¹ Auk, XXV, 1908, p. 320.

moment during a stay of one and one half hours, and while one of the two was silent, the other sang freely, mocking very distinctly fifteen of our common species. The record gives these mockings as the Bluebird's mellow notes, the Blue Jay's whistles and calls, the Flicker's flicking notes, the Brown Thrasher's song, the Catbird's calls and song, the Chickadee's *dee-dee-dee-dee*, the Purple Finch's call, the White-breasted Nuthatch's song, the Sparrow Hawk's "killy killy," the Northern Shrike's whistles and calls, the Red-winged Blackbird's whistles, the Phoebe's song, the Robin's song and cackles, the Crow's spring notes, and the Song Sparrow's song. This was my first experience in falling in with a good mocker. His performance was given mostly between 9 and 10 A. M. On April 25 this bird was again found singing in the same locality and added the Towhee's call to his repertoire previously heard. The second bird did not appear.

On April 11, 1909, Mr. Richard M. Marble informed me he observed a Mockingbird (13) in Franklin Park, further record of which was not obtained. In the late autumn once again a Mocker (14) was present in the Arboretum and was observed on November 13 and 22, singing freely on both of these dates, and was also seen on December 4, 14, 20, and January 31 following, when he was naturally silent. And when the spring of 1910 had come and on April 6 I visited the Arboretum, this bird undoubtedly the same, was again in song, and on the following day two individuals (14, 15) were present and both singing. As neither of these birds did any mocking, but sang only their own song, it may be assumed, perhaps, that they were young males and inexperienced songsters, although not necessarily so, since it is testified of Mocking birds in the South that it is not unusual to find a male who is not a mocker, or is a mocker to a very limited extent. One of these singing males continued under observation to the end of April, but the other dropped out of notice at once.

In this year, 1910, two individuals (16, 17), quite widely separated, were present in Franklin Park and seen on January 12. I record that one of these birds was "calling loudly and incessantly" for a time and that "I had not before heard this sharp call from any of the Mockingbirds hitherto met with, which have invariably been silent during the winter season."

When December came, as had been not unusual in our experience, a Mockingbird (18) appeared in Olmsted Park by Leverett Pond and was seen on the 13th day by Mr. Barron Brainerd and on the 17th by Mrs. Bridge. Frequent walks through the park during the early months of the year following revealed this bird there throughout January, February, March, and April to the 17th day. On March 10 the bird had begun to sing and continued to be heard in song to the day of final record. On March 29, he mocked several common species, and on April 8, he gave a fuller performance, mimicking at least fifteen species, including Blue Jay, Bluebird, Robin, Phoebe, Goldfinch, Sparrow Hawk, Chickadee, Brown Thrasher, Catbird, Northern Shrike, Ruby-crowned Kinglet, Crested Flycatcher, Downy Woodpecker, Flicker, and Bobolink. When the walk was taken on April 20, no Mockingbird was heard or seen, nor upon subsequent days.

In this year, 1911, in Riverway Park, near Longwood Avenue, a Mockingbird (19) was observed on February 9, 17, 23, March 1 and 7. And on March 13 and 17 two individuals (19, 20) were present in this park, one in song and the other silent, thus suggesting a female, and, perhaps, a pair. These birds continued to be under observation, one or both during the remainder of March and up to April 8 inclusive, beyond which date neither was in evidence. One bird continued a songster without mimickings, and the other bird was not heard in song. Mr. E. E. Caduc informed me that on March 19 he saw still another individual (21) in this park, passing three Mockingbirds successively according to his careful and discerning observation, and the bird located by Leverett Pond constituting a fourth in less than a mile of the parkway bordering Muddy River on the Brookline side.

When the fall of 1911 came, again a Mockingbird (22) was present in this park and was recorded on October 12, November 19, 28, December 25, and January 18 the year following. And in Olmsted Park by Leverett Pond a Mocker (23) again wintered with many records of observation from December 24 through January, February, and March, to April 3, 1912. On March 9 and 14 this bird softly sang the song of the species only, without mocking, within the shrubbery at the very entrance to the park at Huntington Avenue, while the bird of the previous year, which

had also spent the entire winter and early spring farther up in the park, had sung exclusively as a mocker. The same winter a third Mockingbird (24) was under observation at Chestnut Hill Reservoir with records from January 18 to April 4. This bird was not heard in song and was assumed to be a female.

Once more, when the fall of 1912 came, a Mockingbird (25) was seen in Olmsted Park by Leverett Pond, being first noted on October 18 and repeatedly seen afterward through the winter and early spring to April 13, 1913. In October and on November 3 and 14, and again in March on the 16th day and in April this bird was in song, executing, however, few distinguishable mimickings. After the date named in April it was not in evidence throughout the later spring and summer, but re-appeared in the same locality and on nearly the same day, presumably the same bird, in October, and was first recorded on the 19th day, when he was in song, and again on the 30th day, when he sang very beautifully, so that I record him as "The first singer of all the individuals which I have heard in the succession of years. There were no harsh notes, and there were few pauses in his song, and much variety, surpassing other winter examples which I have heard." He was still in song on November 17, and he remained in his chosen location and was recorded in December, and in January, February, March and April, 1914, being heard in song on March 29 and up to April 10, after which no records were obtained, and there was an apparent summer absence. But in October a Mockingbird was again in evidence in this locality, first recorded on the 19th day, and on November 25 as still in song and occupying the same oak as did the bird of the previous year, therefore seeming to be the same individual returned to former winter quarters. But in subsequent walks through this park no Mockingbird was seen, and this bird, presuming it to be the same individual, disappeared from our ken after three successive appearances in successive Octobers, the first two of which were followed with full winter residence continuing into the month of April, the 13th and 10th days respectively.

In the spring of 1915, on March 26, a Mockingbird (26) again was recorded in Riverway Park, scolding sharply as Bronzed Grackles flew into the shrubbery which it occupied. On April 12,

this bird was again seen, and on May 14 was still present and singing. In the autumn once more an individual (27) appeared in Olmsted Park beside Leverett Pond, being first recorded on October 8, when it "gave some very clear, beautiful whistles." On November 11 it was still in song and produced several mimickings. This bird was recorded also in December, January, and February of the winter of 1915-16, but not after February 10. On that day it had wandered beyond the confines of the park, and was found calling sharply and constantly on the premises of a residence on Allerton St., and, perhaps, following the neighborhood through, found a favorable spot of its choice beyond the confines of the park.

In our enumeration of Mockingbirds observed in the region of Boston, mostly within its precincts, we come now to one whose permanence of residence and powers of mimicry far surpass the record of any of the before mentioned birds. On January 10, 1915, this Mockingbird (28) was first seen in the Arboretum, the observation of which has continued with but temporary interruptions to the present time. Mr. Charles E. Clarke 'phones me to-day, while I have been engaged on this paper, that yesterday, January 26, 1920, he saw this Mockingbird still in the Arboretum, having wandered up the side of Bussey Hill from the shrub garden, its usual haunt. Unlike all the other individuals which have been enumerated this bird has summered and wintered there for five years, and has now entered upon the sixth year of his residence. In no one of the seasons has there been any evidence that he has had a mate, or that there has been a nesting of the species. Yet this bird has been a most joyous singer throughout all the regular seasons of song, both spring, summer, and fall, year by year, and has shown no disposition to wander elsewhere from any spirit of discontent or restlessness to find a mate. He has become a fixed permanent resident, braving all the rigors of severe winters and luxuriating in all the spring, summer, and autumn efflorescence and fruitage of this richly stocked park, in which are grown all the trees and shrubs which can be cultivated by a high order of intelligence in this climatic zone. Our resident Mockingbird has chosen the section known as the shrub garden for his haunt. A profusion of berries is here matured season by season for winter food, and thickly branching shrubs afford shelter from cold searching winds.

As evidence of the hardiness of this particular bird, it may be stated that he went safely through the winter of 1917-18, when there was a temperature on one morning of eighteen degrees below zero Fahrenheit, with below zero registration of four to ten degrees on four other consecutive mornings, December 29 to January 2 inclusive. I asked the superintendent of the grounds if he knew of any assistance being rendered the Mocker in this extraordinary test of its endurance, and he replied that he knew of none. This Mocker, self-reliant and unaided, braved all this severity, and again very low temperatures, later in January, and a cold wave in February, which once more sent the mercury down to a dozen degrees below zero. On March 23 he had begun to sing, perhaps, some days earlier. The only period of the year when this Mockingbird has passed from observation has been in August and September, when having completed his spring and summer singing he has probably gone into retirement for the annual moult. Again, in October, year by year, he has come back into evidence and into song, the song period lasting to the middle of November. From that time to the middle of March or thereabouts the bird has remained out of song, a winter period of four months. Mr. Charles E. Faxon informed me that in my absence in the summer of 1915, it sang up to July 27, Mr. Van Der Voet, superintendent of the grounds, and happily maintaining an eye and ear open to the birds therein, testifies similarly, that this bird sings well into July and then passes out of notice for a time, but re-appears in October. Not unlikely his seeming disappearance is due in part at least to his silence and the removal of one very emphatic evidence of his presence. The eye remains then, as the only sense for detecting him, and as it is the season of dense foliage, it may well be that in his quiet movements and shy estate due to molting he remains undetected among the shrubbery.

This Mockingbird's repertoire is very extensive. It has increased since the first season of his singing. He has developed into a mocker exclusively, not seeming to sing at all the song of the species. The mimickings succeed one another in such rapid succession that one hardly has time to name one to himself before it is succeeded by another. But if the listener remains an hour or longer with him, there is usually a return to some of his rarer

mockings, and so opportunities for renewed interpretations recur and more certain identifications of his rarer voicings can be secured. I have had many interesting experiences in listening to the performances of this bird. One can approach very near to him while he is thus engaged in singing, indeed, almost to the very tree or shrub on which he is perching. And he varies the perches of his choice somewhat, but has a few definitely chosen ones. Some are within the quietude of the shrub garden and some are beside the Arborway drive bordering the grounds outside, where there is a constant movement of motor vehicles in close proximity to him. In the spring seasons of 1918 and 1919 he made choice rather more frequently of this outside location, where it became necessary for the listener to make quite close approach in order to hear distinctly his voicings. He seemed to like the constantly varying companionship of the passing cars with their occupants, who, however, knew nothing of the Mocker's presence in their rapid passing by. Here on the slope of a ridge of extended length, covered largely with oaks and planted with berry-bearing shrubs along the roadway, he has given very full renderings of his remarkably varied repertoire. For instance, on May 6, 1918, he was inspired by a temperature which rose to 88° to especial responsiveness and gave mimickings of twenty-four different species in an hour or so. These were Brown Thrasher's song, Bluebird's song, White-breasted Nuthatch's call and song, Phoebe's song, Robin's song and cackle, Blue Jay in all its various voicings, Bob-White's "scattered" call, Sparrow Hawk's "killy-killy," Flicker's song and "flicking," Barn Swallow's song, Chickadee's "phebe" and "dee-dee-dee-dee", Catbird's call and song, Baltimore Oriole's song and chatter, Yellow-throated Vireo's song, Kingbird's song, Towhee's song and call, Yellow Warbler's song, Canary's song, Rose-breasted Grosbeak's song, Ruby-crowned Kinglet's call and song, Red-Shouldered Hawk's call (given separately from his Blue Jay's mimickings), Red-eyed Vireo's song, Scarlet Tanager's song and call, Cardinal's song. The combinations and variations seem endless, so quickly does he pass from one phase of song to another with various calls interspersed. Such singing may not be regarded as the highest type of bird music, but it certainly displays very wonderful powers of mimicry and self training.

On May 11, five days later, twenty-one different mockings were recorded, including seventeen of those heard on the previous occasion and four others, namely Mourning Dove's "coo," Meadow-lark's call and rattle, Song Sparrow's song, and Warbling Vireo's song. To these were added on May 20 the Red-winged Black-bird's several calls.

In the spring of 1919, this Mockingbird had acquired a still wider repertoire. He was found singing as early as March 15, a day of temperature range from 23° to 35°, but with fair skies and warm sun. He was further heard on March 26 and April 7 and 14 having added to the number of his mimickings, the Northern Shrike's whistle. And on April 23, he had regained his full powers, and twenty-nine distinct mockings were recorded. In addition to eighteen of those already mentioned were eleven others, namely, Kingfisher's rattle, Chipping Sparrow's trill, Field Sparrow's song, Tree-Swallow's song, Cliff Swallow's call, Carolina Wren's song, Crested Flycatcher's challenging call, Nighthawk's call, Oven-bird's "teacher" song, Cuckoo's call, and even Bantam Fowl's barnyard voicings. On May 10 there were further recorded Downy Woodpecker's song or long call and the Whip-poor-will's song. He was also heard to imitate the frog's guttural roll and the fall cricket's chirp. In the autumn also, after his period of obscurity, this Mockingbird has a season of free singing. In 1918, on October 15, I listened to much varied mocking and recorded twenty-one clearly defined mimickings. These included his more usual voicings and to these were added, as imitations, not previously recorded, the House Sparrow's calls. On October 28, thirteen days later, a still more varied singing was noted, when twenty-six different mimickings were clearly identified. These included, besides twenty-two mockings already recorded, five new ones, namely, the Starling's calls, the Hairy Woodpecker's rattle call, the Crow's call and the Olive-backed Thrush's "pip" and querulous calls. On October 30 the repertoire was equally varied with twenty-six different mockings including the calls of Olive-backed Thrush, the songs of Warbling and Red-eyed Vireo, of Ruby-Crowned Kinglet and Tree Swallow. To these were added the call of the Bronzed Grackle. The day was very summery, with a range of temperature from 67° to 78,°

wind southwest. On November 7, a week later, the diversity of the mockings had not lessened, and the bird seemed still as fully in the spirit of song as in the previous winter, or as in the days of spring. The House Wren's song was heard and the White-eyed Vireo's song. By November 13, however, he was evidently losing much of this spirit of song, as only brief snatches of melody were heard, and on the 19th I found him silent. In the fall of 1919 he sang up to November 18. It may be stated, therefore, that this Mockingbird's season of fall singing has ended by the 20th of November, but has extended to about that date. At this time he is the only dependable singer among the birds, and his voice is, therefore, appraised high.

I have enumerated fifty-one species of birds which this Mockingbird of the Arboretum has been heard to imitate. The songs or calls of many of these are unfailingly interwoven in his singing and recur frequently. Others are quite often heard, but may fail to gain expression during an hour's visit with the bird. Still others are but rarely given, seldom gaining utterance, and have been heard but few times. What this Mocker may have achieved in other hours than those I have spent with him must remain unrecorded. It may well be that in my many visits with him I may not have heard all the mimickings of which he is capable and which he may have actually given. But the testimony here offered is sufficient to mark him a most extraordinary mocker, excelling, perhaps, in this power all other Mockingbirds whose repertoires have been recorded, so far as my reading has extended. I wonder if his life alone, without a mate or other individuals of his species can have contributed in any measure to this development of his voice, tending to throw him entirely upon his own resources for satisfaction and pleasure. If so, he is a most philosophical bird and merits admiration for his resourcefulness as well as his great achievements. Like most Mockingbirds he can be bold and aggressive toward other birds which come in his way and dart at them and chase them fearlessly, if they annoy him. He can also scold loudly with sharp chirps when disturbed, offended, or alarmed.

Mr. S. Waldo Bailey of Newburyport has recorded another remarkable instance¹ of power of mimicry in the case of a Mocking-

¹ Auk XXVIII, July, 1911, p. 372.

bird heard by him in early June, 1908, and which remained in his locality nearly a week, when he recognized twenty-nine distinct imitations, a list of which he gives. These include six which I have not heard from the Arboretum bird, namely, Least Flycatcher, Wood Pewee, Vesper Sparrow, Indigo Bunting, Maryland Yellowthroat and Wood Thrush.

This Arboretum Mockingbird passed safely through the winter of 1919-1920, which has gone on record as, perhaps, the severest winter within forty years in its depth of snow and repeated low temperatures, the snow packed so hard to a depth of two feet or more that no attempt was made to open up the grounds and they were trackless for weeks as regards vehicular travel. But the Mockingbird secured its food and necessary shelter notwithstanding, while scarcely a person on foot entered the grounds and for the time being there were no bird observers to determine whether the Mocker was safely weathering it. But some mild days had brought spring-like conditions in late March, and when the Arboretum was visited on the 25th day, the Mockingbird was seen in his accustomed spring and summer haunt, not in song, but silent while we remained. We learned that he had first been seen by Mr. Van der Voet on the day preceding and was then still in his adopted winter haunt. On March 28, a visitor heard him mocking. He is now upon his sixth year of residence in the Arboretum. But it proved that he remained in evidence in April to a far less degree than in previous years, and instead of being an almost constant singer was heard to sing but infrequently. I am given records of his singing as heard by Mr. Charles Schweinfurth of the Bussey Institution, in the Arboretum grounds, on a morning in early April, in the lower branches of an English elm just east of the Institute building; again heard on May 1 in shrubbery bordering the drive by the small ponds; once again on May 3, about 5.15 P. M., when "the Mocker was in splendid form in the forsythias on the slope of Bussey Hill." Mr. Schweinfurth further states, "It was on Tuesday, May 4, as I was walking through the Arboretum in the early evening with a friend that we watched this bird singing beautifully and imitating several species on the road going from the Centre Street entrance toward Hemlock Hill.

He was perched in the top of a leafless, young tree, and we watched him and listened to him several minutes."

In my own visits to the Arboretum on April 24 and 29 the bird was seen, but not heard to sing, and on May 6, 12, and 17 he could not be found. I was informed on the last named date by the superintendent, Mr. Van der Voet, that an observer had told him that he had seen a second Mockingbird present a few days previous, speaking with assurance of the fact. Since this five-year resident Mockingbird is no longer seen or heard within the grounds, it may be surmised that we have the explanation in this alleged appearance of a second bird presumably a female, with which the long resident Mocker has mated and gone elsewhere for a nesting. If so, it may prove to be a happy occurrence, should progeny be reared to increase the representation of northern bred and resident Mockingbirds, some of which progeny may inherit the father's remarkable powers of mimicry.

Four other individuals should be enumerated to make the local list more nearly complete. Mrs. Edmund Bridge reported to me a Mockingbird (29) seen by her in West Medford on December 28, 1916. At Wellesley Farms I saw a Mocker (30) on May 11, 1917. Mr. E. E. Caduc informed me that on May 7, 1918, he found a second Mockingbird (31) singing in the Arboretum, this bird being in the same portion of the grounds as the permanent resident Mocker and that both birds were heard in song between four and six o'clock in the afternoon. This bird evidently was a migrant, as it was not further recorded. In the Fresh Pond Reservation, Cambridge, a Mockingbird (32) was seen on November 1 and December 11, 1918, and again on January 15, 1919. On the first named date it was quietly singing without apparent mockings. On the next date the bird was giving his sharp calls, and on the last occasion was silent.

In the Riverway and Olmsted Parks where individuals were present successively in the years, 1910 to 1916 inclusive, one, two, or three birds as winter residents; I have no knowledge of any individual having been seen in the last three years. That period covers their largest representation in Boston's parks, during which fifteen of the Mockers enumerated were seen. This may be due in part to the very regrettable pruning and thinning of the shrub-

bery throughout the extent of these parks, so that no close grouping has been kept and individual shrubs have been reduced to almost skeletons of their former selves. The consequence has been that fewer winter birds have remained, like the Song Sparrow and the White-throated Sparrow, and there has been an entire absence of the Mockingbird. The same injudicious treatment has been applied to the Public Garden with similar results as affecting ground feeding birds which seek covert in shrubbery. As records of the Mockingbird in the region of Greater Boston have been scattered along in years past, perhaps no sure experience can be drawn as to whether the species has been gaining a stronger foothold locally in recent years. But since Mr. Henry D. Minot in his 'Land Birds and Game Birds of New England,' published in 1876, characterized the Mockingbird as "a very rare or almost accidental summer visitor to southern New England," which statement Mr. Brewster in the revised edition, published in 1895, in a footnote as editor, qualified to the extent of characterizing it as "a local and very uncommon, but probably quite regular summer resident of southern New England, seen oftenest on or near the coast, one or two specimens have been taken in Massachusetts in winter," we may fairly regard the species as having had an essential increase in its representation in the Greater Boston Region, and increase in the period of twenty years between the two editors of the above named publication, and a further increase in the twenty-five year period since Mr. Brewster penned his footnote. That it should be with us as a winter resident rather than as a summer resident is the strange fact. For the winter resident Mockers appearing in the autumn or early winter are seldom known to remain in evidence beyond April, and the nestings of the species which have been recorded in the last thirty years, 1888 to the present time, require scarcely more than the fingers of both hands to enumerate, so rare have they been. What, then, becomes of these Mockingbirds with us in the fall, winter, and early spring is shrouded in mystery. One can only say that the species more than merely retains its hold in this section, absentees in the summer returning in the fall or other individuals coming in to take their places. Happily it does not succumb to the rigors of the climate in winter, but has proved itself eminently hardy and avails itself of the region

for winter residence, while, so far as our knowledge extends, it has not become a regular breeding bird in this section. Where it does breed to provide these winter resident birds is the mystery. May it not be that a very few nestings do occur summer by summer and some young are raised beyond the ken of the many field observers and thus a small but increasing representation has been maintained? There are certainly contributing factors of one kind or another, else we should not have continued to be in possession of even the limited representation of Mockingbirds, which we have. And the records indicate that all the winter resident birds, except the five-year resident Arboretum bird, move out of their chosen wintering haunts to localities where they live unobserved during the nesting season. And it may be assumed that some of these have found mates and bred, and thus have preserved the small representation happily maintained. A few nestings and probable nestings have been recorded in the issues of 'The Auk' and other publications in the series of years as occurring within the bounds of Massachusetts. These records are *bona fide* evidence that young are raised and that nestings occasionally, even if it be very infrequently, come to the knowledge of observers.

It is natural also to suppose that some migrant Mockers may push up into this northern limit of their range from the south in the spring, although the evidence of this is very limited, so comparatively few of the records presented are those of birds first observed in spring. There are but five out of thirty-two which indicate the presence of a Mockingbird that might be an actual spring migrant, the other twenty-seven occurrences being those of birds discovered in the fall or winter or too early in spring for any extended migration, and in most instances of birds being resident throughout the winter or far into it. The number of these in the enumeration is twenty-five. Thus our fall and winter appearing birds have not to any extent disappeared early enough to be regarded as migrants seeking the south. Indeed, migration of the species either in the spring northward or in the fall southward is but slightly indicated by the dates of the records. So it would seem that this northern representation is largely resident and is maintained probably by a limited number of nestings, few of which come to the knowledge of observers, and that this has

has been the case in a long series of years; also, that the maintenance of the species thus far north has been assisted to some extent by very limited migration. For a few spring migrants may slip unobserved into their breeding places year by year, especially females, not making their advent known by song.

ELSEWHERE IN MASSACHUSETTS.

In the following tabulation (pp. 399-402) are presented such published records for Massachusetts as have been found in a search through the literature, as well as additional instances supplied by various correspondents, arranged in chronological order.

Additional details are here given concerning a few of the later occurrences.

In 1909, the nesting of a pair of Mockingbirds on the grounds by Mr. Francis H. Allen at West Roxbury was a notable occurrence, a detailed account of which was published in 'The Auk' of October of that year.¹

The birds of this family were last seen on August 8. But subsequent information furnished by Mr. Allen to Mr. Thomas L. Bradlee² shows that a Mockingbird was seen in the same locality on October 7, 1909 to May 14, 1910; again from November 6, 1910 to April 14, 1911, and still again was seen on November 5, 1911, it being regarded as presumably the same bird. Mr. Allen in a letter under date of February 29, 1920, informs me that this Mockingbird at his home was seen off and on from November 5 aforesaid to December 9 and re-appeared on March 7, 1912, being seen also on March 9, 17, 28, and April 20. Mr. Allen writes that in the interval between December 9 and March 7 this Mocker was seen about a quarter of a mile away on January 2, and in another place, also about a quarter of a mile away, on April 22. This Mockingbird, therefore, regarded as identical season by season, spent four complete seasons of wintering in this locality of West Roxbury, namely, from November 22, 1908, to April 22, 1912, being the father of a brood in the first summer after his appearance, but not seen in either of the summers following, but disappearing, as far as observation went, respectively on May 14, April 14, and April

¹ Auk XXVI, 1909, p. 433.

² Auk XXIX, Apr. 1912, p. 249.

ADDITIONAL MASSACHUSETTS MOCKINGBIRD RECORDS

No.	Place	Date	Notes	Observer	Reference
1	Nahant	June, 1852	single bird	J. A. Allen	Proc. Essex Inst., 1864, vol. 4, p. 67
2	Springfield	Summer, 1855-60	pairs, breeding	Mrs. E. Harrington	Am. Sportsman, 1875, vol. 5, p. 370
3	Salem	June, 1874			
4	Newtonville	Nov., 1874	shot	H. A. Purdie	do do
5	Newtonville	Mar. 6, 1875		E. C. Greenwood	do do
6	Nantucket	Oct. 8, 1878	shot	G. H. Mackay	Bull. N. O. C., 1879, vol. 4, p. 64
7	Cambridge	Sept. 20, 24, '81	male	Brewster & Spelman	Mem. N. O. C., 1906, no. 4, p. 361
8	Fresh Pond	Dec. 10, 1881	female	C. R. Lamb	do do
9	Taunton	Mar. 26, 1883	adult female	J. C. Cahoon	Forest & Stream, 1883, vol. 20, p. 185
10	Arlington	Aug. 15, 1883	brood of 4 & adult	W. S. Townsend	Auk, 1884, vol. 1, p. 192
11	West Springfield	Summer, 1883	male (? pair)	R. O. Morris	Auk, 1889, vol. 6, p. 340
12	West Springfield	Summer, 1889	male (? pair)	do	do do
13	Nantucket	Aug. 11, 1889		G. H. Mackay	Auk, 1891, vol. 8, p. 120
14	Tatham	Sum., 1888-1891		R. O. Morris	Auk, 1892, vol. 9, p. 74
15	Marshfield	Aug. 15, 1889	breeding	H. A. Torrey	Orn. & Ool., 1889, vol. 14, p. 144
16	Sherborn	Oct. 26, 1889	pair and brood	E. J. Smith	Morse, Birds of Wellesley, 1897, p. 40
17	West Springfield	Apr. 26-Aug., '90	pair (? breeding)	R. O. Morris	Auk, 1891, vol. 8, p. 117
18	Marshfield	Sum.-Oct. 22, '90	pair and brood	H. A. Torrey	Orn. & Ool., 1891, vol. 16, p. 174
19	North Truro	Sept. 11, 12, 1890	2 or more young	G. S. Miller, Jr.	Auk, 1891, vol. 8, p. 119
20	Nantucket	Nov. 20, 1890	shot	G. H. Mackay	Auk, 1891, vol. 8, p. 120
21	North Scituate	? Nov., 1890	shot	J. B. May	in litt.
22	Quincy	Dec. 1, 1890	shot	E. H. Lothrop	Forest & Stream, 1891 vol 35, p. 511
23	Belmont	Apr. 5, 13, 1891	male	W. Brewster	Mem. N. O. C., 1906, no. 4, p. 361
24	Hyannis	Aug. 30, 1891		C. B. Cory	Auk, 1891, vol. 8, p. 395
25	Waltham	Apr. 7, 1892	young bird	H. A. Purdie	Mem. N. O. C., 1906, no. 4, p. 362
26	West Springfield	Summer, 1892	male	R. O. Morris	Auk, 1892, vol. 9, p. 74
27	Lynn	Apr. 4, 1893	pair	C. E. Chase	
28	Ipswich	Apr. 4, 1893	male	N. Vickary	Orn. & Ool., 1893, vol. 18, p. 51
29	Amesbury	Nov. 7, Dec. 16, 1893	pair	B. F. Damsell	Auk, 1913, vol. 30, p. 28

ADDITIONAL MASSACHUSETTS MOCKINGBIRD RECORDS (Continued)

No.	Place	Date	Notes	Observer	Reference
30	Framingham	Nov. 15, 1894	male, shot	F. C. Brown	Auk, 1895, vol. 12, p. 94.
31	Nahant Beach	before 1895	nesting pair	R. O. Wentworth	Auk, 1895, vol. 12, p. 308
32	Groton	June, 1895	male singing	C. F. Batchelder	Auk, 1898, vol. 15, p. 333
33	Taunton	Apr. 30, 1896		B. A. Scudder	Auk, 1897, vol. 14, p. 106
34	Ludlow	late May, 1896		R. O. Morris	Coll. Berkshire Hist. Soc., 1900, vol. 3, p. 120
35	Cheshire	July, 1896		R. T. Fisher	
36	Worcester	Apr. 27-May, '97	male singing	Miss H. A. Ball	Auk, 1897, vol. 14, p. 224
37	Taunton	Nov. 11, 1897	♀ shot	A. C. Bent	Auk, 1898, vol. 15, p. 59
38	West Medford	Sept. 23-Nov. 27, 1898	killed by storm	Mrs. E. Bridge	in litteris
39	Belmont	Oct. 26, Nov. 17, 1898		R. Hoffmann	Mem. N. O. C., 1906, no. 4, p. 361
40	Belmont	Mar. 25, 1899		G. C. Deane	do
41	Belmont	Oct. 15, 1899		A. Frazer	do
42	Cambridge	Oct. 26, 1899		O. A. Lothrop	do
43	Pigeon Cove	Spring, 1901		Mrs. Marshall	do
44	Danvers	Early Apr., 1902		Mrs. E. S. Fowler	do
45	Danvers	Apr., 1902		do	do
46	Roslindale	Feb. 27-Sum., '02	nesting pair		Auk, 1911, vol. 28, p. 116
47	Duxbury. Powder Pt.	Oct. 5, 1902-June 18, 1903	? female	G. Emerson	
48	Nahant, East Point	Dec. 28, 1903, Jan. 30, 1904		King, Wellman & Wright	Bird-Lore, 1904, vol. 6, p. 8
49	Belmont	May 29, 1904	male	R. Hoffmann	Mem. N. O. C., 1906, no. 4, p. 361
50	Dedham	Dec. 18, 1904-Feb. 3, 1905		R. B. Worthington	F. H. Allen, in litt.
51	Fall River	Apr. 11, 1906		Mrs. M. B. Horton	
52	Lexington	Feb. 8-Jy. 10, '07		W. Faxton	Auk, 1907, vol. 24, p. 446
53	Ipswich	Jan.-Apr. 26, '08		Miss S. E. Lakeman	Mem. N. O. C., 1920, no. 6, p. 170
54	Newburyport	June 5-?, 1908	♂, wintered	S. W. Bailey	Auk, 1911, vol. 28, p. 372
55	West Roxbury	Nov. 22, 1908-Aug. 8, 1909	♀, nested with above male	F. H. Allen	Auk, 1909, vol. 26, p. 433
		Apr. 2-Aug., '09			

No.	Place	Daté	Notes	Observer	Reference
56	West Roxbury	Oct. 7, 1909-May 14, 1910	? one of above pair	F. H. Allen	Auk, 1912, vol. 29, p. 249
57	Cohasset	Nov. 17, 1909	two birds	Mrs. Edmund Bridge	in litteris do
58	Cohasset	Jan. 28, 1910	one bird	Miss L. L. Hetzer	do
59	Groton	Winter, 1909-10	breeding pair	E. P. Bucknell	in litteris G. M. Allen
60	Nantucket	June 27, 1910	breeding pair	C. R. Lamb	Mem. N. O. C., 1920, no. 5, p. 170
61	Pigeon Cove	Sept. 20, 21, 1910	? same bird as 55	F. H. Allen	Auk, 1912, vol. 29, p. 249
62	West Roxbury	Nov. 6, 1910-Apr. 14, 1911		F. P. Spalding	in litteris
63	Squantum Head	Mar. 11, 1911		C. W. Townsend	Mem. N. O. C., 1920, no. 5, p. 170
64	Ipswich	Aug. 28-28, 1911	pair and 1 young	T. S. Bradlee	Auk, 1912, vol. 29, p. 249
65	Nantucket	Oct. 23, 1911	? same as 55	F. H. Allen	do
66	West Roxbury	Nov. 5, 1911-Apr. 22, 1912		Miss L. L. Hetzer	do
67	Groton	Nov. 9, 1911	? same as 59	W. S. Brooks	Auk, 1912, vol. 29, p. 249
68	Manomet	Dec. 14, 1911		J. Kittredge, Jr.	Mem. N. O. C., 1920, no. 5, p. 170
69	West Gloucester	Feb. 9, 1912	three birds	A. P. Morse	in litteris
70	Quincy	Apr., 1912		Mrs. E. P. Fowler	in litteris
71	Danvers High-lands	Nov. 12-26, 1912		C. J. Maynard	Mem. N. O. C., 1920, no. 5, p. 170
72	Hamilton	Oct. 19, 1913		F. H. Allen	do
73	West Roxbury	Mar., 1914	seen twice	Mrs. H. B. Horton	in litteris
74	Westport	Apr. 5, 1914		Miss M. G. Hinds	Bird-Lore, 1915, vol. 17, p. 210
75	Watertown	Nov. 29, 1914-Nov. 2, 1915		F. B. Currier	Mem. N. O. C., 1920, no. 5, p. 170
76	Newburyport	Sum., 1914-1917	annual nesting	E. M. Stetson	in litteris
77	Nonquitt	Sum., 1915 or '16		Dr. C. W. Townsend	Mem. N. O. C., 1920, no. 5, p. 170
78	Ipswich	Aug. 28, 1916		Mabel Comstock	Bird-Lore, 1916, vol. 18, p. 361
79	Greenfield	Summer, 1916	nesting pair	Mrs. M. B. Horton	in litt.
80	Westport Harbor	Nov. 7, 1916		Mrs. Babson	Mem. N. O. C., 1920, no. 5, p. 170
81	Gloucester, Pigeon Cove	Jan. 17-May 9, '17		Mrs. M. B. Horton	in litt.
82	Fall River	Apr. 2-15, 1917	♂ in song	E. M. Stetson	do
83	New Bedford	Dec., 1917-early			

ADDITIONAL MASSACHUSETTS MOCKINGBIRD RECORDS (Continued)

No.	Place	Date	Notes	Observer	Reference
84	Danvers	Mar., 1918 late Nov., 1917- late Mar., 1918	same bird two years died	Mrs. E. S. Fowler and A. P. Morse	do
85	Edgartown	(a) Dec. 21, 1918- Jan. 4, 1919 (b) Feb. 1-late spring 1917 (c) Oct., 1917-Spr., 1918 (d) Nov. 1, 1918- Spring, 1919 Aug. 26, 1919- Apr. 6, 1920 Wint. prev. to '20 May 19, 1918	male; returning four winters	Mrs. J. B. Worden	do
86	Springfield		♂	R. O. Morris	in litt.
87	Brookline		♀	F. H. Allen & C. W. Townsend	do
88	Marion	Oct. 3, 1918-May 1920?		Miss L. H. Hand	do
89	Rowley	Nov. 15, 1918		J. D. Sornborger	Mem. N. O. C., 1920, no. 5, p. 170.
90	Williamstown	Winter, 1908-19		Walter Faxon	in litt.
91	West Roxbury	Jan. 5, 1919		F. H. Allen	do
92	Dartmouth	(a) Feb. 22-May, '19 (b) Nov. 17, 1919- Mar., 1920	? ♀	Mrs. F. H. Stone and Mrs. E. M. Stetson	do
93	Danvers	Mar. 28, 1919	♂ in song	A. B. Fowler	do
94	Arlington Hts.	May 19-Oct., '19	do	T. L. Quimby	do
95	Arlington	first half of Je., '19	do	Miss A. W. Cobb	do
96	Bridgewater	late Nov., 1919- Apr. 29, 1920		Miss V. T. Wells	do
97	Cohasset	(? Dec. 10, 1919) Jan. 7-Feb. 8, '20		Dr. J. B. May	do
98	Mattapoisett	Ja. 1-Apr. 26, '20		J. E. N. Shaw	do
99	Roxbury	Dec. ?	B. S. N. H.		

22, when, we may suppose, he left in the search of a mate. It will be observed that his mate appeared on April 2 of the first season and that he waited a considerable time after that date each succeeding season before taking his departure. The dates of his subsequent returns year by year are interesting as indicating that as the season of winter approached he sought the same hospitable quarters which had served him well the previous winter and winters, returning respectively on October 7, November 6, and November 5.

Mr. E. P. Bicknell of New York gives me the details concerning the pair of Mockingbirds seen by him on Nantucket June 27, 1910. Mr. Bicknell writes, "The evidence was quite conclusive that they had either eggs or young on the grounds of an unoccupied summer cottage near the bathing beach. Both birds always showed increased concern whenever I approached a certain spot where the beach grass (*Ammophila*), that grew all about, was thickly massed along an old fence. They uttered harsh cries and frequently dashed close to my head, and once when, in searching for a fledgling, I was bending down and parting the grass, one struck my back with considerable force. No young were discovered nor could any nest be found in the few small pine trees nearby. A nest may have been in a thick growth of Japanese honeysuckle along one side of the house, but as I was leaving the island by the mid-day boat, there was not time enough for a complete search. The next year, when again on the island in June, I explored the same locality a number of times, hoping that the birds might have returned, but nothing was seen of them. I know of no other record of the Mockingbird on Nantucket, except the old one of Dr. Brewer, October 8, 1878. It is a scarce bird about my home on south-western Long Island, where I have not seen one for several years."

Concerning Mr. Currier's nesting records in Newburyport, he writes that he saw one each in 1914, 1915, and 1917. In July, 1915, he saw them in many places," indicating probably the members of the two families of that summer, when the young were grown. He mentions hearing two male birds sing in the seasons of 1915, 1916, and 1917, "his own" Mocker and one other. As late as August 1, 1916, he records "two singing not a great distance apart, about

three fourths of a mile from his house." In 1915, in July, he heard one singing often, about all day and half the night near his house, probably his permanent resident Mocker returned after the season's nesting.

This series of nestings in Newburyport in four successive years, 1914 to 1917, very closely resembles the series recorded above in Springfield about 1860 on the authority of Dr. Allen and in 1888 to 1891 on the authority of Mr. Morris, the intervals ranging very little and the limit coming at the end of four seasons between these rare series of breeding occurrences. These Newburyport nestings may be regarded as in harmony with the fact that Essex County has been also the chosen breeding ground of other southern species, whose northern limit penetrates Massachusetts, such as the Orchard Oriole, the White-eyed Vireo, and the Yellow-breasted Chat, representations of which have been more constant in that county than in other portions of the State. It may also be noticed that the seven nestings and all but two of the winter records are subsequent to 1913, or within the last six years, indicating an unparalled presence of breeding and winter resident birds within this period, which marks a most encouraging strengthening of the foothold of the species in Essex County. And may we not venture to conclude that the records of winter resident Mockingbirds scattered so widely in recent years even into Maine, indicate that these winter residents find mates and families of young are raised, perpetuating, let us hope, and increasing the northern representation already well established in New England.

Mrs. E. P. Fowler of Janvers furnished the record of a Mockingbird in Worcester, seen early in April, 1902, in the garden of Judge Forbes. The bird was in full song, Mrs. Fowler states, and adds that on the third day of their visit to its locality they learned that the gardener had killed it, misunderstanding an order to kill some other birds. Mrs. Fowler further states, "early that same year after the above incident we learned of another Mockingbird near the mansion house in Green Hill Park. We went and saw this bird. In a few days some careless boys stoned and killed it." Two shocking tragedies.

Mr. T. L. Quimby furnishes the record at Arlington Heights in 1919. Mr. Quimby writes, "As I recall it, it was the morning of

the 19th or 20th of May that I first saw the bird, and I saw him several times afterward in the locality back of the Thorncliff Academy on Robbins road. My attention was first called to him by the exuberance of his song, singing from the tip-top of a cedar tree. One of his favorite antics was to spring directly up into the air, four or five feet from his perch, and while hovering there pour forth his full-throated song. Others later saw him with me. I thought at one time later that I had seen the female, but of that I am not sure and doubt much if I did. I searched the thicket round about very thoroughly for the nest, but without avail." Mr. Quimby continued to see this bird "at intervals up to October, later in the season about the golf links just a little south of his former haunts." Mr. Quimby, under date of March 15th, is quite sure that he saw this Mockingbird a few days ago having completed a winter residence in that vicinity. Later, under date of May 11, he writes, "I have satisfied myself that I have seen the Mockingbird since last summer (and fall), I have thought more than once that I had caught a glimpse of him at a distance, but I have my doubts, for I have not been able to locate him near his haunts of last summer, and I made a very thorough search last Sunday."

Mrs. Edmund Bridge informs me that in the fall of 1898 a Mockingbird appeared on her place, September 23, and came daily up to November 27, the date of the great blizzard. Mrs. Bridge states, "On that day, at 4 P. M. this bird was found half frozen in our ivy vine where it had taken refuge. It was taken into the house by my friend Mrs. Sass who tried hard to revive it, but in vain." In this instance we have an early fall bird, which, if it had had migrating inclinations, would naturally have earlier disappeared, remaining and plainly undertaking winter residence, in which as have many others which are herein recorded, it might have been successful, except for the terribly destructive storm which overtook it. Mrs. Edmund Bridge also informs me that she observed two Mockingbirds in Cohasset on November 17, 1909. She states that these birds were three miles apart, and so could not have been the same individual, and that on January 28, 1910, she saw one bird, presumably one of the former two.

Regarding the record of a Mockingbird seen by Miss. L. L. Het-

zer about the Lowthrop grounds at Groton on November 9, 1911, she adds that "Two winters before one wintered there and was seen at intervals throughout the winter about the grounds."

Mr. Winthrop S. Brooks¹ saw a pair at Manomet, Plymouth County, on December 14, 1911. One of these, a female, he shot and gave to the Boston Society of Natural History. The bird has been mounted and is shown in the Society's collection of New England birds.

Mrs. E. S. Fowler, under date of March 29, 1920, states of the bird seen at Danvers Highlands on November 12, 1912, that he remained the last two weeks in the month; that he sang most of the daylight, but became so hungry for the crumbs scattered near the piazza that the house cat caught and killed him; and that Dr. Fanning of Danvers owns the mounted specimen.

Mr. Edward M. Stetson of New Bedford writes me under date of March 17, 1920, of a Mockingbird in his grounds in the winter of 1917-18, definitely observed on January 13, having been present two or three weeks earlier. Mr. Stetson states "He stayed with us practically all winter, and we saw him at intervals of a few days until he disappeared in the spring, early March, I think. He didn't seem to mind the cold weather and seemed very cheerful on the coldest days. I remember hearing his voice from the top of an oak tree one morning, when the thermometer was only 4° above zero. I never heard him sing a real song, but he had a cheerful little warble which he gave occasionally and which sounded very unusual on a cold winter's day."

Mrs. M. B. Horton reports concerning the Mockingbird at Westport Harbor on November 7, 1916, that a friend informed her that she saw the bird every day for two weeks, but did not hear it sing.

Mrs. James B. Worden writes me an interesting account of a Mockingbird at Edgartown, which is now, 1920, spending its fourth winter in gardens of shrubbery there. It appeared in the winter of 1917, being first seen by Mrs. Worden on February 18, 1917, but she states that it had been present from the first of the winter; that when the spring came, it sang, and that it remained

¹ 'Auk' XXIX, April, 1912, p. 249.

about the garden and around the centre of the town until late spring but was not seen through the summer; that on October 17 it re-appeared in a garden not far from where it was first seen, and it remained in these gardens nearly all winter and sang again in the early spring but that by the time the trees were well leaved out, again it disappeared from view until November 1, 1918, from which time it was heard once more all the winter; that Mrs. Chadwick fed the bird each winter, and it became very tame; and that once more it disappeared when the trees leaved out, but was seen however, by Mrs. Worden on August 26, 1919, when she observed it fly down and catch a moth on a path beside the garden where she usually saw it and then fly back into the shrubs. This occurrence leads Mrs. Worden to think that, perhaps, the bird has remained thereabouts all the time but was not observed. But it would seem to be unlikely that summer by summer it would entirely escape detection throughout the season in haunts that were of its choice the remainder of the year, but that rather it changes location sufficiently, perhaps, to term the movement a migration, and so departs from and returns to its chosen winter haunt year by year. The August date on which it was seen in 1919, namely, the 26th, is near enough to autumn and remote enough from tree-leaving time, to admit of such migration, limited as it may have been. The Mocker's love of concealment, however, when not moved with desire of song and display may, however, account for the later portion of the season of absence as only apparent, but I think not, for the entire period extending from late spring to mid-October, or the first of November, which times mark this Mocker's real re-appearance to be in evidence thence forward winter by winter until late May. In 1919, Mrs. Worden's letter states that Mrs. Chadwick did not see the bird in its accustomed place until November, the usual time of its re-appearance. Under date of March 12, 1920, I am informed that Mrs. Worden saw this Mocker on March 1, 2, and 9, proving that it had passed safely through the very severe winter of 1919-20, and by letter of May 7, Mrs. Worden informs me that her last observation of the bird was on April 6, "when it was making a great show of itself flying about in its usual haunts. I did not hear him sing this spring as the weather has been so wet and I dared not venture out. Mrs. Chadwick, who

returned after the middle of the month (April), has not seen or heard him. I know of no one feeding him this winter."

Mr. A. P. Morse furnishes me with the record of a Mockingbird at Danvers, January 4, 1919, "found tangled in a tendril of Virginia Creeper" and which "had an injured foot." This bird is now in the Essex County collection of the Peabody Museum of Salem. Mrs. E. S. Fowler of Danvers kindly supplies the earlier data of this bird. She states that it appeared in the last week of November, 1917, and was then singing; that it was seen several times in February and up to late March, when it was also singing but then disappeared from observation; that, however, it made its re-appearance, presumably the same bird, in December, about the 21st day, on Lindall Hill, and sang even then; that it was fed daily by Mrs. Peach, who on January 1, 1919, noticed that it had an injured foot which left tracks of blood on the grass, having lost a toe, so that it could not cling to the vine on the house where it was accustomed to perch and could not walk well, and fearing for its safety, she took it to the Peabody Museum,. This bird was then well started on its second winter in the neighborhood after an apparent absence from late March preceding.

Miss Louise H. Handy of Marion writes me under date of May 27, 1920, that this Mockingbird, first appeared there on October 3, 1918, singing in subdued tones, and continued to sing on later dates. He passed the entire winter in the vicinity of the hotel and remained throughout the summer of 1919, singing freely, and seen and heard by the hotel guests. On October 7, Miss Handy states that she saw two Mockingbirds, both feeding on cranberry bushes and rose hips, but after November only one was seen. When the Cedarbirds and Pine Grosbeaks came, he would not feed on the cranberry bushes at all, and not until they left did he go to them. He was still there on October 7.

Mrs. Frances H. Stone, informs me through Mr. E. M. Stetson of New Bedford that a Mockingbird appeared on her summer place in Dartmouth, near Nonquitt, on February 22, 1919, and that she saw it, off and on until April or May, when it disappeared for the summer; that it came again on November 17, 1919, and stayed around until quite recently, but that it seems to have departed again now. (The date of the letter is March 26, 1920.)

Mrs. Stone reports that she had not heard it sing at all, and that since the big storm of February 5th it was minus a tail. The record indicates a female bird, which in 1919 left her winter quarters in April or May, probably for mating and nesting, and in November returned. Her disappearance in late March, 1920, indicates an earlier wandering than in 1919, (due, perhaps, to the accident which befell in the loss of her tail.) A letter under date of May 3 states that Mrs. Stone has not again seen the bird, and "she surely would have seen it, if it had not gone away, as it stayed around near the house most of the time." At the time of its disappearance warm spring weather was prevailing.

Mr. J. E. Norton Shaw in letters under date of March 3 and 12, 1920, furnishes the record of a Mockingbird in Mattapoisett in the winter of 1920, which was first seen on January 1, and on the 18th began to come to feed on the berries of the high laurel bushes in a piazza box with other birds, and since that date has been approximately a daily visitor. Mr. Shaw writes, "This bird which now comes to my hand is, I think, a female, as it is not as definitely marked as the first one I saw (referring to one seen in Marion in 1919). Since February 18 I have seen it every day. So far it has made no sound except angry chirping as though scolding other birds who interfere with its feeding." Mr. Shaw then describes four feeding places he has provided for the birds, one on a window ledge, two suspended from branches of a maple tree close to his veranda, and a fourth on the ground beneath the tree, where he has spread hay seed from the barn loft. Mr. Shaw states, "The Mockingbird has taken charge of these four feeding places. It perches in the maple tree from which the boards are suspended, arriving as early as 6.15 A. M. and staying until nearly dark. It seldom leaves for more than a few minutes. It has done this now for about a week or ten days, growing gradually bolder. It frequents all the boards and the ground, even coming to the window board and peering into the house. It attacks every bird that approaches these boards or the feeding ground." Mr. Shaw then graphically describes an attack this Mockingbird made upon a Flicker which appeared and started to eat and fastened to one of the boards, stating that after working itself into a rage, ruffling its feathers, whetting its beak, and shifting from one perch

to another, finally it dropped directly upon the back of the Flicker and darted at him with its beak; that it soon again descended on him and knocked him completely off the board, the Flicker falling half way to the ground as though injured, and then going to the trunk of the maple tree, while the Mockingbird flew back and forth near him, swooping past him; that very shortly the direct attack was renewed when the Flicker flew back to the board, the Mockingbird descending upon him and repeatedly striking him with its bill; and that small birds are attacked in the same way, except that he has never seen them actually hit, but they are driven from the boards and feeding ground constantly. Mr. Shaw states, "To offset this, I have established a second feeding ground with a suspended board on the north side of my house, under a large fir tree. Here, though less protected, the various birds now collect to feed." Mr. Shaw enumerates eighteen species, including the Mockingbird, which had visited his feeding places in the last days of February 1920. And still later, under date of May 1, 1920, Mr. Shaw writes, "The Mockingbird has been with us daily up to Monday, April 26. On that day it stayed around the feeding board until nearly dark. For the last month it has fed solely on dates, with an occasional bite of cooked fat beef. One day it did not appear at all up to six P. M., when I discovered that no dates were on its board. I did not see it anywhere, but went out and put its usual amount at the feeding place. Inside of five minutes it was at the board feeding, although apparently nowhere in the offing when I went out. I have listened carefully for its song, but have heard nothing except the harsh chirp with which it warns other birds. I have not seen it since last Monday, although we have watched carefully. It has remained very belligerent, attacking Blue Jays and Robins and showing much annoyance at any bird that came near." The absence of song up to late April indicates a female bird and its time of disappearance is in agreement with many other records of wintering Mockingbirds.

In the period 1884 to 1895, inclusive, thirteen years, ten nestings occurred, a period when our earlier ornithologists were much afield with gun to collect and were apparently stimulated by the earlier reported occurrences to gain for their own collections as full a re-

presentation of the species breeding locally as might be within their acquirement. Sentiment has been changing during the last twenty years under the influence of the Audubon Societies, and no longer, I think it may be said, would the taking of Mockingbirds in their family life be sanctioned for even private scientific use. The protective laws which an intelligent public opinion has enacted, crystalized under the head of the eminent ornithologists themselves, are a further safeguard against this.

Of these records, in thirteen instances the bird is actually recorded in winter; in six of these it spent all or most of the winter; in two instances it was observed up to November 17 and 27 respectively, in the latter case dying from exposure; and in the case of the three occurrences, wherein the bird is recorded as shot, the dates are November 11, 15, and 20 respectively, all of which November dates are certainly late for birds intending full migration. The more natural presumption is, I think, that these birds had intended winter residence. The October 26 occurrence at Sherborn, a rather late date for migration, may not mark, it is fair to assume, the date of the bird's departure, but signifies it was seen on that day and that day only. The earlier occurrence at Wiantucket, when the bird was shot on October 8, may be regarded as indeterminate in respect to migration or winter residence. The notable feature of the list is the absence of September and the fewness of October occurrences, the period of the the year when migrating Mockingbirds would naturally be getting away, and when the individuals which were not purposing migration might be holding themselves in seclusion in haunts where food was still plentiful and foliage still gave abundant shelter, these birds seek village and park for winter residence, as the season advances towards winter and the conditions become wintry.

Records of the occurrences of the Mockingbird in the other New England States and in Canada follow.

CONNECTICUT

In 'Birds of Connecticut' by Messrs. Sage, Bishop, and Bliss, 1913, fourteen records of Mockingbirds are presented, namely, in Stratford and New Haven (Lindley)¹; Saybrook (J. N. Clark);¹

¹ Merriam, *Birds of Conn.*, p. 7.

Milford (G. B. Grinnell);¹ Suffield, (Lester);¹ near New Haven, May 30, 1877 (Osborne);¹ New Haven, seen by Dr. Bishop, December 18, 1882; Jewett City, nest with five eggs, June 20, 1884, second clutch of three eggs, June 28, female shot (Prior)² West Haven, one reported seen, July 21, 1894; New Haven one flew into greenhouse, November 2, 1904, seen by Dr. Bishop; Middletown, one seen June 9, 1907 (Cady); West Hartford, one seen by Mrs. L. A. Cressy, November 30, 1910, to February 9, 1911; (Mr. Lewis W. Kipley, Chairman of the Hartford Bird Study Club, who holds the composite records of the club, transmits to me the record of an extension of this bird's stay to April 17). Another seen the same winter by Mr. Edward P. St. John;³ Portland, one seen by Mrs. C. H. Neff, February 8 to April 4, 1911.

Mr. Albert Morgan of the New Haven Bird Club, under date of May 9, 1920, gives these further details of the West Hartford Mockingbird of the winter of 1910-11, which was first seen by him one morning in early November. "When I spoke about my find before the members of the Hartford Bird Study Club, one of the young lady members mentioned the fact that she had been feeding a similarly marked bird hard boiled eggs at her window sill and then I found out that my bird was the second seen within about a mile of each other in the town of West Hartford that winter. The one under my observation would not touch boiled egg, but ate ground up meat scraps, (cooked) with a relish. My visitor stayed with me until April, and not once did I hear it utter a note of any kind, he left the region of my house as silently as he came."

Mr. Charles E. Prior⁴ states concerning the nesting at Jewett City in 1884 that the first batch of five eggs was taken and that two of the three eggs of the second batch were also taken, after which one more egg was laid; that the nest was in a blueberry bush by the side of a rail-fence which separated the barren fields from the highways; that the male bird was not seen and that the female was shot; and that he and his companion also took the bush containing the nest and the two eggs.

¹ Merriam, *Birds of Conn.*, p. 7.

² O. and O., IX, 8, pp. 94, 95.

³ Bird Lore, XIII, 2, p. 97.

⁴ O. and O. IX, 1884, 8, pp. 94, 95.

Mr. St. John states concerning the West Hartford occurrences, in the winter of 1910-11, that the two birds were commonly found about a mile apart, both remaining very near the places where they regularly fed, though they had been seen together a few times at one feeding station, and that Mrs. Cressey and a neighbor believed that three Mockingbirds had visited the food tables, but not more than two had been seen at one time."

Following the enumeration of the fourteen records in 'Birds of Connecticut,' Mr. Sage states, "The late Frank L. Burr, of the *Hartford Times*, once told me that about the time of the Civil War a pair of Mocking birds nested in the meadow north of Avon St., Hartford. There was no question as to the identity of the birds, but the eggs were destroyed. A year or two later a pair had a nest quite near a house on Wethersfield Avenue in the same city. This nest also had eggs which were destroyed. Gurdon Trumbull, the artist and ornithologist of Hartford, now dead, informed me that he remembered distinctly two or three pairs of these birds nesting, about 1860, in what was then known as Gillette's Grove, Hartford. He saw the birds and heard them sing. The eggs were taken by Mr. Trumbull and a boy friend.

These Hartford nestings in the early sixties, mentioned as four or five in number, have a special significance when viewed in connection with those which occurred in Springfield, Massachusetts, about the same time. The year 1860 is named in both instances as well as the few years next following. It would seem, therefore, that period was a time when the Mockingbird made one of its stronger efforts in the northern limit of its ranges to become a regular summer resident, and in the records already given indicate another similar effort in Massachusetts, in the five year period 1888 to 1892, when occurred eight nestings, four in Springfield, 1888 to 1891, one in each year; one in Marshfield, 1889; one in Provincetown, 1890; one in Hyannis, 1891; and one in Ipswich, 1892.

Mr. Arthur G. Powers¹ in 'Bird-Lore's' Christmas census of 1911, at Hartford, records under date of December 24, a Mockingbird, and adds, "To my knowledge a Mockingbird has spent the last three winters in the same identical spot, even staying in the

¹ Bird-Lore, XIV, 1, 1912, p. 23.

same clump of rose bushes nearly all of its stay. I have watched diligently for three years to learn of its summer haunts, but am still as much in the dark as when I began. Last winter I saw two others wintering in different places in West Hartford, all three disappearing synchronously." These individuals, it may be assumed, were the same as those recorded above by Mr. St. John, except that Mr. Powers observed one of the birds for *three* successive winters.

I have seven other Connecticut records all subsequent to the publication of 'Birds of Connecticut,' except three, namely:

Mr. Lewis W. Ripley furnishes from the records of the Hartford Bird Study Club the record of a Mockingbird in song seen at West Hartford on March 14, 1904.

Mrs. Florence C. Paine of East Woodstock contributes through Mr. A. W. Upham the record of a pair of Mockingbirds coming to her garden in that town in the year 1906 and remaining three and a half days. Mrs. Paine states, "They appeared one beautiful afternoon when the Oriental poppies, iris, and other perennials were in bloom, so I think it was early June. The male bird sang but little that first day until night. There was a full moon, and we were awake many times following them from one side of the house to another, as singing they flew about to different trees and alighted on the piazza rails about the house and by our bedroom windows, the song sounding so loud in the quiet moonlight. They selected a large old appletree just outside the flower garden for a home and began to build. Alas, the Robins living there claimed the whole tree and flew at them every time they brought a stick or straw. They stood their ground bravely for two days, as they are great fighters, and both they and the Robins lost many feathers before they gave up and flew away, to be seen no more, leaving a nest about a third built."

Mr. H. C. Bigelow informs me under date of March 14, 1920, that a Mockingbird spent the winter of 1906 on Cedar St., New Britain, about a greenhouse. Mr. Bigelow states that the bird was around there more or less all winter, but that he did not see it after the warm weather came in the spring; that it did not sing, but gave only a clear chirp; would peck at the seed pods on the rambler roses, and was fond of apples put in the crotches of shrubs for it.

Mr. Bigelow has not heard of one being seen in New Britain since.

There was a Mockingbird lived at Fairfield¹ in 1914 noted on September 16 or on earlier by Mr. W. B. Wheeler and seen on September 27 by Mr. Wilbur F. Smith. This bird continued to be observed up to October 14 by Mr. Wheeler and was then singing from his gate-post. Mr. Smith also furnishes a record for Bridgeport in 1916, stating, "The last of February I was told of a bird that puzzled those who had watched it all winter, and, on March 3, I went and found it to be a Mockingbird; it had been about Laurel and North Avenues all winter."²

Mr. Lewis W. Ripley also furnishes the records of a Mockingbird seen at Windsor on January 14, 1912, and of one seen at Plainville on April 9, 1914, which was singing.

Mr. Wilmot records one in the centre of West Haven,³ which "appeared on November 8, 1916, and has been observed almost every day up to January 22, 1917. It usually appears with a flock of Starlings. It pays no attention to food put out for the birds, but prefers to eat the berries of the bittersweet and honeysuckle vines which grow along the fence." Mr. Wilmot states⁴ further concerning this bird, "I announced in the April, 1917, number of 'The Auk' the presence of a Mockingbird in West Haven from November 8, 1916, to March 24, 1917. (Mr. Wilmot's records as published did not extend so far.) On July, 1917, the bird returned and is passing the winter at the same place (January 20, 1918.) Last winter the bird would not take food put out for it, but preferred to eat honeysuckle and bittersweet berries, but this winter it takes food put out for it and has become so tame as to alight on the window-sill and eat food. I have also observed it eating the dry seed pods of the asparagus which it swallowed whole, as it does the berries of the bitter sweet.

"On November 18, 1917, at Colonial Park, a summer resort about two miles from West Haven, I observed another Mocker which was eating the berries of a honeysuckle vine that grew along a fence. The extreme cold weather during the last few days of De-

¹ Bird-Lore, XVII, 2, 1915 p. 130.

² Bird-Lore, XVIII, 3, 1916, p. 173.

³ Auk, XXXIV, April 1917, p. 215.

⁴ Auk, XXXV, April 1918, p. 229.

cember and the first of January I thought would surely kill our Mocker, but he came through all safe and seems none the worse. During that time the thermometer went as low as twelve degrees below zero, which proves that Mockingbirds are not altogether southern birds, but can stand our northern winters. The plumage of this bird is quite different this winter, having a great deal more white in the wings and tail, so I would judge that it was a young bird when it passed the winter of 1916 and 1917 with us."

Mrs. Gilbert W. Chapin of Hartford contributes the record of a Mockingbird seen by her and two other members of the Bird Study Club near Arnold's Ice Pond in West Hartford on March 15, 1919. Mrs. Chapin states that the bird was singing, but not the full song as heard by her in the south, that, however, it was the real song of the Mockingbird, but not as loud and more fragmentary; and that several succeeding days they visited the vicinity, but failed to find it. Mr. George H. Gabriel¹ was also an observer of this bird which he found singing in a small peach tree in a backyard he informs me. The bird evidently was changing locations, either by limited migratory flight or mere wandering. The date is rather early for full migration from the south.

Four, perhaps five, of these records indicate winter residence, one of them a return of the bird for a second and a third winter.

Of these twenty Connecticut records with definite dates, from 1877 to 1919, a period of forty-two years, ten are those of winter resident birds, including one which was probably such; five are summer records, including the nesting of 1884, and the attempted nesting of 1906, two represent fall visitants; and three are early spring visitants. In ten instances the bird was observed on one day only, indicating that it was probably changing location, or was not followed up by the observer. One wintering bird returns a second winter and another a second and a third winter. In the case of seven of the winter records the bird was constantly in view for weeks, and in two instances continued to be in evidence until April 4 and 17 respectively, a time when Mockingbirds which have completed winter and early spring residence generally disappear from their chosen winter haunt, as the Greater Boston and many other

¹ Bird-Lore, XXI, 4, 1919, p. 243.

records indicate. Shall we not assume that the desire for a mate actuates them at this time, and that probably a fair proportion of them are successful in their quest, and nestings ensue, of which in many instances we gain no knowledge? Certainly, it is not a likely supposition that these northern winter resident birds leave New England for more southern locations after enduring the rigors of its climate throughout the winter and reaching the opening spring. And, after all, although the number of intelligent observers has largely increased within the past twenty years, it must be true that a comparatively small area of New England, even in its more populated portions, is carefully or at all methodically searched by competent observers.

RHODE ISLAND.

'Birds of Rhode Island' by Reginald H. Howe, Jr., and Edward Sturtevant, published in 1899, with 'Supplementary List' in 1903, contains five records for the State, covering eight individuals, within the period 1877 to 1897 inclusive. They are these: "Mr. A. W. Thatcher took a bird in East Providence in 1877. Mr. Harry G. White reported one singing at Newport on November 2, 1888. Lieut. Wirt Robinson writes that he saw one at Newport on November 5 and 12, 1889. Mr. F. T. Jencks observed one at Drawnville, October 18, 1891, and he has since seen two others there. There was a pair in Roger Williams Park, Providence, in the autumn of 1897." It will be observed that all of these records, except the first, which is without seasonal date, register autumn occurrences. One bird, is recorded as singing on November 2, as might be expected of a male, since the fall period of song usually extends at least a fortnight later.

Mr. Harry S. Hathway of Providence, under date of March 31, 1920, has given me the following six records. I quote: "Dr. Edwin R. Lewis of Westerly told me in February, 1900, of a pair of Mockingbirds which have been summer residents near the farm of Frank Larkin on Beach St., in that town for three years. The Larkin family had lived in the south and were sure of the identity, for they knew its song. Last fall, 1901, I saw the fourth Mockingbird I have seen since living at Brownsville, (F. T. Jenks). Edwin Dow informed me he had seen a Mockingbird in the orchard back of

his home in Auburn on three or four occasions the last week in May, 1902, and he fully described the bird and song, leaving no doubt as to the identity. June 24, 1917, I saw a Mocking bird in bushes beside the road at Dunn's Corner, Westerly. It flew to a telephone wire, where it stayed for a few minutes and gave me a good opportunity for examination. I did not see it again in this locality, although I visited it on several occasions a week apart."

March 9, 1920, Mr. Moses J. Barber informed me that a Mockingbird had been feeding on suet, suspended in the bushes in his yard, since early in February, at East Greenwich. The bird has not been seen since. A Mockingbird was seen eating berries from a window box on February 27, 1920, by Miss Louise C. Humphrey in Rumford. Miss Humphrey is a former resident of the south and knows the Mockingbird well."

Seven other Rhode Island occurrences have been recorded. They are, a bird at Bristol in 1910 noted by Miss Julia Herreshoff,¹ who states, "The Mockingbird came with the blackbirds, just noticed March 12. I did not see him after July 25."

A second occurrence is a nesting at Barrington in 1911, an account of which ² is given by Miss Bertha B. Smith, who records that on April 7 a single bird was seen, which on the 19th, and three days following on account of its song was identified as a male; that on April 24 two birds were seen and from that date until the last of June they were observed almost daily. Miss Smith states that their nest was discovered about the middle of May in a spruce tree and contained four eggs; that only three young were known to hatch; that the birds stayed near the place of nesting and seemed inclined to quarrel with other birds; that early in September the adult birds and their young were seen every day, but that on September 20 the male alone remained and was observed until October 21; that a few days later, however, the female re-appeared with the male and both were seen daily; that on February 8, 1912, they were still in the vicinity, and the family owning the grounds near which they nested fed them all winter.

Under date of May 29, 1912, Miss Smith wrote, "The Mocking-

¹ Auk, XXVIII, 1911, p. 116.

² Bird-Lore, XIV, 5, 1912, p. 310.

bird (male) is still in Barrington, but we have been unable to discover any other individual this spring. Of the three that were hatched last spring only one was with the parent birds in the fall. All three birds were seen late in November, and then for a few weeks they disappeared. The male returned and stayed all winter. This spring I have made careful search and inquiries, but find only one bird." Mrs. M. B. Horton of Fall River observed this Mock in Barrington on June 12, 1912. Mr. E. E. Caduc has obtained records of two other occurrences. He informs me that in company with Mr. W. E. Pring they saw two Mocking birds in Swan Point cemetery, Providence, on December 1, 1912. Mr. Caduc states, "The birds appeared to be feeding on berries of some kind and were quite tame, allowing us to pass about 25 feet from them without taking flight. On many subsequent visits to the same spot I have failed to note them. But on January 11, 1920, in company with Miss Ida Jenkins, we came upon a single bird not far from where I had found the others. He was not as tame as they and flew as soon as he saw us, but we had a good view of him and could readily identify him. These birds were seen very near the main entrance to the cemetery."

A sixth record¹ is furnished by Mrs. Annie B. McConnell, who saw a Mockingbird on November 30, 1917, about her place at Watch Hill all the morning, and who states that she had seen the bird several times during the fall, but not close enough to be sure of its identity until the 30th.

Mr. Edward H. Perkins includes a Mockingbird in his Christmas bird census² 1917 for Kingston and Narragansett Pier, seen on December 24.

Dr. Windsor M. Tyler contributes the record of a Mockingbird seen by him at Saunderstown, R. I., on January 26, 1919.

Mr. Hathaway has obtained from Miss Elizabeth C. Dickens of Block Island, R. I., her records of the Mockingbirds seen there, which have been kindly transmitted to me. They are: three seen together on August 23, 1914, in the bushes and on the fence at the "Gull's Nest" one first seen on August 30, 1915, and seen on several

¹ Bird-Lore, XX, 2, 1918, p. 159.

² Bird-Lore, XX, 1, 1918, p. 28.

occasions later; one first seen on August 26, 1916, and repeatedly seen afterwards; one first seen on August 17 1917, and observed again on September 4; one seen on December 20, 1917, of which Miss Dickens states, "The children reported seeing it again the second week in January, 1918," and adds, "I have heard on good authority of one wintering here before;" one seen, December 23, 1918, the first record having been on September 17, of which, under date of February 4, 1919, it is stated, "This bird is wintering;" one seen on September 15, 1919; and in 1920, "One came to food put out by a High School girl at her home in the first week in February and kept on coming, and presumably the same bird is still here, for she has seen it every morning since in the nearby trees (March 13)."

A later letter states, "There seem to be two Mockingbirds, one at the home of the High School girl about a mile north from the Manisses Hotel, and one in the hotel trees, so the student reported on April 10." This second Mocker may have appeared in this neighborhood as a spring arrival and from no very distant locality.

These records of Miss Dickens are of unusual interest as showing how unfailingly in the last six years the Mockingbird has visited Block Island in the fall migration, appearing in late August and in September, when birds resident farther north are moving south, and the records quite suggest such a movement on the part of more northern representatives of the Mockingbirds. In three of the last four years it has been found that an individual has remained for winter residence. Miss Dickens chronicles the arrival of but one presumable spring migrant Mockingbird and no summer resident Mockers, even the wintering birds of recent years failing to continue to be observed when spring has come? The records of Miss Dickens cover at least eleven different individuals, and quite possibly more, for she thinks that the early autumn arriving birds year by year may not have been identical with the later wintering birds; as there were not frequent and repeated observations of the respective individual birds throughout the fall season. And it may be that one or more of the wintering Mockers should be regarded as the same individual returning to the same locality for winter residence after a full summer absence. Miss Dickens does not offer testimony on this point. But other contributors of re-

cords in other localities have offered quite conclusive evidence that such as has been the case in several instances.

The later Rhode Island occurrences furnish one complete winter resident record of a pair which had nested in the previous summer, the female being noted up to February 8, or later, and the male continuing throughout the winter and spring; two other winter records, one of them of two birds seen on December 1, and the other of a single bird seen on January 11, in both instances indicating winter residents; a fourth record of a bird seen up to November 30; which would seem far too late a date for one intending migration south; and a fifth record as early in the spring as March 12, which on the other hand would seem to be far too early a date for migration north, unless it can be established that the Mockingbird is one of the earliest spring and one of the latest fall migrants, coming with the March arriving birds and not departing until the latest fall stragglers are leaving; the sixth record is of a male bird in April singing.

VERMONT

In a 'History of Vermont' by Zadock Thompson, 1842, a list of the birds of Vermont is given by orders, and the Mockingbird is not included.

In 'A Preliminary List of the Birds Found in Vermont' by George H. Perkins, Ph. D., Professor of Natural History in the University of Vermont, 1901, it is stated of the Mockingbird; "A rare visitor, and in 1884 a pair nested in Lunenburg, as a result of which they are now in the State collection [Montpelier]." Professor Perkins, under date of March 5, 1920, states "Mr. W. E. Balch told me that he saw the pair, which is in the Montpelier collection, when they appeared in the spring and kept watch of them till late summer, when he shot and mounted them for the State Collection." Prof. Perkins expresses his regret that he is not able to add to our knowledge of the occurrence of the Mockingbird in Vermont.

Dr. Lucretius H. Ross of Bennington writes me under date of February 25, 1920, "The Mockingbird is a rare bird in Vermont. On May 7, 1911, Charles Hitchcock reported seeing a single individual Mockingbird in the outskirts of Bennington village. The

next day I was fortunate enough to obtain a view of the bird. These two observations were the only ones I know of in this section of the State."

The only other record found for Vermont is a brief mention by W. P. Smith,¹ who writes, in reply to query for further information that a pair spent the season of 1919 at Wells River, and were frequently seen coming and going from a certain dense patch of shrubbery. The male was heard in song, though no nest was discovered, it seemed that the birds were breeding.

NEW HAMPSHIRE.

For New Hampshire, there are two published records:

An immature bird, apparently a young of the year, shot at Hampton, August 24, 1900, and recorded by Dearborn.²

A bird seen on the outskirts of Manchester, November 5, 1916, apparently accompany a flock of Robins, which stayed in the neighborhood two days, observed by Dr. William R. Varick, Mr. Lewis Dexter and others. Mr. Carick states, "It did not act like an escaped cage bird, and I have not seen a caged Mockingbird in this region for years."³

I have a third record from Mr. James P. Melzer of Milford, who states that on November 7, 1904, he shot a Mockingbird in that town. "I still have the bird, he writes, I have never seen one here before or since." Mr. Melzer is a taxidermist."

MAINE.

Knowledge is at hand of many occurrences in Maine. Ora W. Knight in his 'Birds of Maine', enumerates the County records as follows, though believing that most if not all of them were escaped cage-birds: Cumberland, "have one, an escaped cage-bird taken at Gorham, August 12, 1890" (Norton); one seen at Portland, January 19-Feb. 19, 1897 (Brown); Knox, "One taken in February" (Racktiff); "have one shot at Vinalhaven, February 1891, an escaped cage-bird" (Norton); Oxford, (Nash); Piscataquis, "one

¹ Bull. Bot. and Bird Clubs Vt., No. 6, Apr., 1920.

² Dearborn, Ned., Birds of Durham and Vicinity. Contr. Zool. Lab. N. H. Coll. Agric., No. 6, p. 94, 1903.

³ Auk, XXXIV, 1917, p. 91.

shot in Monson, October 20, 1884, did not seem to have been a caged bird" (Homer); Washington, "One observed near Calais in 1870" (Boardman).

Mr. Nathan Clifford Brown¹ contributes to 'The Auk' the record of a Mockingbird in Portland observed from January 19 to April 4, 1897, a period of eleven weeks. Mr. Brown states, "The bird appeared in a gutter which runs beneath the south window of my study. The thermometer was below zero, and there was no snow, but an unclouded sun had softened the ice in the gutter so that the bird could moisten his tongue; and this he seemed to be doing when I first saw him. He was, perhaps, five feet distant from my chair, and I noted at once that he looked like a wild bird, his ruffled plumage being in perfect condition, unfrayed and unstained. A heavy snow storm set in the next day. It was followed within the week by another. Wintry conditions prevailed generally up to January 29." On January 31 Mr. Brown again saw the bird, now on a neighbor's grounds. Mr. Brown further states that it was seen nearly every day, and "about three o'clock of the afternoon of February 11, the sun shining warmly in a still crisp air, he took up a position in the top of a tall elm before the same window from which I first saw him, and sang loudly for a few minutes." It is stated that, for a brief time following, the bird escaped notice, but on March 6 it was again observed, and following another considerable period of obscurity, it was once more seen by other observers on March 24 and 28. Mr. Brown states, "On neither of these occasions was he more than an eighth of a mile from the spot where he first appeared in January. Finally, on April 4, I met with him again myself, in the same section of the city as before. I walked within a few yards of him and watched him for several minutes, while he disputed with some Robins the right to a cluster of sumacs, the fruit of which had no doubt helped to carry him through the winter. Up to the present time (June 1). I have neither seen him or heard of him since."

The 'American Naturalist'² published the following note contributed by Mr. G. A. Boardman of Calais, "I found a Mockingbird,

¹ Auk 1897, pp. 224, 324.

² Amer. Naturalist, V, Apr. 1871, p. 121.

Mimus polyglottos, in the woods up the river this past season (1870?). This is the first time the bird has been found in Maine, to my knowledge, and I think it could not have been an escaped cage bird."

An extract¹ from the Journal of Captain Herbert L. Spinney, First Keeper Seguin Island Light, situated at the entrance of the Kennebec River, under date of September 17, 1896, the occurrence of a Mockingbird on the island, as follows, "During the day, I shot a Mockingbird (*Mimus polyglottos*, Linn.), which proved to be a male bird. It was very wary, and it was with much difficulty that I secured it. It did not show signs of having been caged, although it might have been. About the same date the preceding year, I am positive I saw a bird of the same species fly from the east side of the north cove across to the trees, but it eluded all my efforts to capture it, and I did not again see it."

Mr. Wm. L. Powers,² under "Some Notes from Gardiner" states "The Mocking bird (*Mimus polyglottus*, Linn.) is without doubt an occasional summer resident in the State of Maine. Some twenty or twenty-three years ago, [about 1885] a pair nested and reared their young in the town of Leeds. This fact is certified to by four individuals who had lived for some time in Louisiana, where these birds were very plentiful. One of these four people had lived in Louisiana twenty years, and Mockingbirds were as well known to him as Robins are to us. Mr. L. W. Robins of Randolph, Me., believes that a pair nested near his house last summer. He heard one singing nearly every morning for a month, and all indications pointed to nest building, although the nest could not be located. The singing ceased all at once, and it was feared the bird was shot. One thing, however, is certain, and that is that Horner Dill, of Gardner, Me., took a specimen near his home on the morning of December 14, 1906. The skin is now in my possession and has been examined by Mr. Norton, Curator of the Portland Society of Natural History." It is suggested that Mr. Robbins' experience may have been with a male Mockingbird only, if no female was seen and nest was not located. Records of other lone Mockingbirds singing freely point to this as not improbable.

¹ Journal Maine Ornith., Soc., V, Oct. 1903, pp. 54, 55.

² Journal Maine Ornith. Soc., IX, 2, 1907, p. 52.

The 'Journals of the Maine Ornithologists' Society', 1899 to 1911, contains these records of the Mockingbird. Mr. W. H. Brownson¹ in an article on "Birds in and around Portland in 1906" states, "April 27, there was a Mockingbird at South Portland, which attracted considerable attention from many observers. Probably this was an escaped cage bird, but there is no evidence one way or the other." The presumption expressed is interesting in the light of many subsequent occurrences, as indicating the earlier trend of thought when a Mockingbird was seen so far north. Again in 1907, Mr. Brownson² records, "On the 19th, [May], a Mockingbird was seen in South Portland and was under observation all day. Last year there was a Mockingbird in the same locality which remained there nearly a week. This year's bird was different from last year's, being smaller and browner in plumage. It has been the custom to declare that every Mockingbird seen in Maine is probably an escaped cage bird. From the fact, however, that a Mockingbird was seen last year at the height of the migration season, and this year at the same time, I am led to believe that these birds were really stragglers who had strayed north with migrating flocks." And Mr. Brownson states in an editorial on p. 48, "In the present number of the Journal are several notes relative to the Mockingbird in Maine. There seems very little doubt that this bird is beginning to find its way as a straggler into the State during the spring migrations, and there is some evidence of its breeding here. The instances of its occurrence in the State have been more frequent of late, and it seems quite certain that these cannot be referred, as formerly, to the category of escaped cage birds."

Miss Elizabeth W. Russell³ under the caption "The Mockingbird Wintering at Portland, Maine," records the first appearance of the bird in a hedge December 15, 1908, "after a heavy fall of snow, followed by rain," and her observation of it for the second time on December 18, when "he flew to the hedge, close to our window and stayed there where I could study him at closerange for half an hour or more, and although it seemed incredible, I could

¹ Journal Maine Ornith. Soc., VIII, 4, 1906, p. 85.

² Journal Maine Ornith. Soc., IX, 2, 1907, p. 51.

³ Journal Maine Ornith. Soc., XII, 1, 1910, pp. 8, 9.

not make him out anything but a Mockingbird." Later Miss Russell learned that this Mockingbird went daily for its food to the yard of a neighbor, who threw out crumbs for the English Sparrows, and it ate with the sparrows. The bird was again observed by Miss Russell on January 20, and February 7. On February 8, it is stated, this bird was heard singing; "his song then was low and sweet, but grew daily fuller and richer, and ten days later he was in full voice. It was his custom to give daily morning recitals from seven or a little later to ten or eleven. I did not hear of his singing in the afternoon at any time. He came safely through our severe winter. I last saw him on April 17th, having a lively scrap with a Robin. On May 4th, I heard him singing, but did not see him, and although I sought him in every possible place, I neither saw nor heard him again."

Mr. Clarence H. Clark¹ of Lubec in "Notes on Washington County Birds," states, "The most interesting thing of recent record is the occurrence of the Mockingbird in this vicinity. The first appearance was November 19, 1910, when one of the species was found in the village. At first it was thought that it might be an escaped bird, but later two were reported, and then a few days afterward three were seen together and were observed at several places within the radius of a mile. I closely and carefully observed them hours at a time on a score of occasions, and at times would get within the distance of a few feet from them. They spent most of their time in orchards and about dooryards, where many people threw out various things for them to eat. I never knew of them being here before, and I think their late occurrence remarkable. They have remained here all winter, and the last report was February 26th." Lubec is at the extreme eastern end of the coast of Maine near Eastport, in Washington County, and it is certainly remarkable that Mockingbirds should have wintered there near the forty-fifth parallel of latitude. Mr. Boardman's record already presented was in the same county forty years earlier and still farther north, above the forty-fifth parallel.

Another wintering Mockingbird in Portland,—ten years later—is briefly referred to in the Cumberland County Audubon Society

¹ *Journal Maine Ornith. Soc.*, XIII, 1, 1911, p. 20.

report,² for 1917, it is stated, "On January 7, 1917, (?), Arthur H. Norton, the well known ornithologist of our own city, gave an illustrated talk on the Mockingbird that was wintering in one of our parks." I am informed that in one or more of the winters since the above mentioned occurrence a Mockingbird has wintered at South Portland. One of these is the subject of an editorial note in the 'Kennebec Journal' of February 28, 1920, a wintering bird.

Other records are supplied in a letter of Miss Bertha L. Brown of Bangor to Mr. E. P. Brown of Belfast, under date of March 31, 1919, from which I have their kind permission to quote. Miss Brown writes, "Most exciting of all to us here has been our Mocking bird who spent most of the winter here. I first discovered him Thanksgiving Day, November 28, 1918, and saw him many times afterwards in the same locality, as did many other of the bird students of Bangor. I saw him last on January 18. Since then I have received several reports from people who think they have seen him in other parts of the city. One report early in February was from a very reliable observer. You know there have been several winter records of them in Maine, but none before so far north as Bangor." Bangor is in almost precisely the same latitude as Lubec. Miss Brown, writing me under date of March 3, 1920, describes the locality which this Mocking bird so far north frequented, "as a little hill, called Summit Park, having an open, sunny hillside spotted with evergreen trees and occasional crabapple trees as well. Just beyond on a side slope of the same hill, is wild land, open pasture dotted with many evergreens. Also on the very top of the hill is a private residence with extensive grounds containing many trees. He seemed to make his headquarters in a couple of crabapple trees in the pasture. He fed on the apples. We did not hear him uttering any sound, except an occasional low chuk or chick. We saw him, almost daily in the vicinity of Summit Park from November 28, 1918, to January 17, 1919; twice also, December 12, and January 18, in another place, familiarly called Birch Hill, a half mile or more distant." Miss Brown adds, "I have heard of one other record of Mockingbird in this vicinity,

² Bird-Lore, XX, 1, 1918, p. 89.

and that should be authentic. Mr. Walter Handy of Brewer, reports having seen one in Holden, a small town near Brewer, the fall previous, exact date. November 11, 1917."

Still another record is given me by Mrs. Charles W. Alexander, from Hallowell, Maine. On January 2, 1919, a Mockingbird appeared at her feeding shelf, attracted apparently by the suet, as well as by cut apples placed for its benefit. It came from one to six times a day until January 21, when it disappeared until February 25. This day it arrived at noon and sang beautifully, and continued until March 11 when it again disappeared. On March 26, it was discovered in a neighboring orchard where it remained until April 1, when its visit really ended. On the evening of June 24, however, it came to Mrs. Alexander's yard again momentarily and then disappeared. What was apparently this same bird was seen in the neighboring town of Winthrop on November 16, 1918. A final record of the series reaches me in a letter of Mrs. Augusta Gardner of Bucksport, to Mr. E. P. Brown, under date of January 29, 1920, concerning a Mockingbird which appeared here on November 17, 1919, and was seen daily until December 13, when it disappeared. It was attracted by the berries on various high-bush cranberries and by crab apples.

These are all quite remarkable records as showing how far north the Mockingbird occasionally undertakes to winter and how hardy and capable of enduring severe northern New England weather it is. It is also remarkable that the Brown records disclose the occurrence of but three spring Mockingbirds and but one occurred nesting, all the others being records of winter occurrences. Where these far northeastern birds summered is an entire mystery. May we not surmise that they have had a part in assured nestings and have contributed to the further representation of northern resident Mockingbirds? Mr. Knight in his 'Birds of Maine,' 1908, was skeptical and expressed the view, "Though specimens [of the Mockingbird] have been captured more or less often, nearly all show indications of being escaped cage birds." This view seems to have widely prevailed in earlier years, so that the presumption then was, when a Mockingbird was seen in New England, that it must be an escape. But clear testimony to the contrary presented time and time again has effaced this early presumption, and there

are now well based reasons for the other assumption, that unless a Mocker should unmistakably show the marks of captivity, it is to be regarded as a wild bird which never lived within the confines of a cage. It is significant that six of the occurrences which I have enumerated were observed in the years 1906 to 1911, and that five have been observed in the last four years, 1917 to 1920, indicating an apparent still further movement of the Mockingbirds northward along the coast and a renewed attempt to push the northern limit of its range beyond its earlier confines. The few scattered earlier occurrences of which we have knowledge, including those of Canada, which are next to be presented, cover a range of sixty years from 1860.

CANADA.

Our survey may be briefly extended to Canada for the few occurrences of Mockingbirds which have been recorded there. Dr. J. Dwight, Jr., enumerates five records. He states,¹ "A young Mockingbird taken in the fall of 1894 and sent to me from Sable Island, Nova Scotia, constitutes the fifth record of this species for Canada. The other four are so scattered and have been so often incompletely quoted, it seems worth while to review them here. They stand as follows: 1. Strathroy, Ontario. A single bird was seen in the town, but not captured, July 1, 1880. 2. Chatham, Ontario. In point of time, 1860, this is the first Mockingbird taken in Canada. Mr. Edwin W. Sandys, who originally furnished the record, was recently seen by the writer, and he tells me the bird was secured by his father and is now in a collection of stuffed birds made by him. It was seen perched on the ridge pole of a barn one June morning just after a warm southerly gale, and its rich song was what first drew attention to it. 3. Hamilton, Ontario. A pair of birds spent the summer of 1883 at East Hamilton. (McIlwraith) 4. Truro, N. S. A bird was wounded and caught alive July 1, 1889. It showed no signs of being an escaped cage bird. 5. Sable Island, N. S. This is a young bird in much worn first plumage, taken in the fall of 1894. I have been unable to obtain any information about the specimen except that it did not

¹ Auk, XIII, Oct., 1896, p. 344.

come to the island in a cage, and we can only assume it was carried thither by some resistless storm, perhaps, from the mainland or more likely from some far more southern home."

Dr. Dwight¹ later contributes one other Sable Island record, "A young male in juvenal plumage was captured September 3, 1902, 'hopping about a woodpile,' " and he states, "It is the second from Sable Island in this plumage."

And there is one later Ontario record, supplied by Mr. James H. Fleming of Toronto, who states,² "I took a male on May 20, 1906, at Point Pelee, Essex County, Ontario. The bird was found near an old orchard on the west side about five miles from the end of the point; the sexual organs were well developed. Mr. B. H. Swales and Mr. P. A. Taverner were with me when the bird was shot."

One other indefinite record is given in a 'Catalogue of Canadian Birds' by John Macoun and James W. Macoun, 1909, namely, "A specimen was picked up on Haymarket Square, St. John, N. B., by a seven year old boy, Ronald Singer, and through Mrs. M. V. Lawrence, brought to me (A. G. Leavitt)." The Hamilton record is presented by the Messrs. Macoun on the authority of McIlwraith as a nesting record, in 1883, based on the testimony that the male bird in song was frequently seen by Mr. Eastwood, in his horseback exercise in the early morning, during the breeding season and that a second bird, the female, was seen on one occasion by him. Mr. Fleming³ in an article on "Birds of Toronto, Canada," places the Mockingbird in the Hypothetical List with this note, "The Hamilton record given by McIlwraith is not altogether satisfactory, and Mr. C. W. Nash, who was familiar with the time and place of the record is doubtful if the bird was correctly identified."

Mr. H. Mousley of Hatley, P. Q., writes me under date of March 8, 1920, "There is no such thing as the Mockingbird at Hatley, at least in my time; in fact it is rare anywhere in Canada." Mr. Mousley has very kindly consulted a list of books on the subject and finds in a 'Catalogue of the Birds of the Province of Quebec,' by C. E. Dionne, 1889, no reference to the Mockingbird, and in 'The Birds of Montreal' by Ernest J. Wintle, 1896, also no re-

¹ Auk, XX, 1903, p. 440.

² Auk, XXII, 1906, p. 344.

³ Auk, XXIV, 1907, p. 88.

ference to the Mockingbirds. But he has found in "The Birds of the Province of Quebec," by C. E. Dionne, 1906, the following reference to the Mockingbird, on page 381, "M. C. J. Schmidt took a specimen on the 8th, of August, 1903, at Anticosti, and N. Comeau states that he took one at Godhaut in the same summer; these are the only instances of its presence in our province." And in 'Birds of Eastern Canada' by C. A. Taverner, 1919, p. 206, Mr. Mousley finds this reference to the Mockingbird: "Distribution, southern United States north into Canada at the Western end of Lake Erie. This is the only locality where the species has obtained what approaches an established foothold in Canada. A few pairs have been known to summer there for the last decade. The species is rare in Canada."

So the testimony of these writers indicates that the northern representation of the Mockingbirds has extended somewhat into eastern Canada, especially at the western end of Lake Erie, where in recent years it has gained "what approaches an established foothold," although still "the species is rare in Canada."

SUMMARY.

Our review of the occurrences of the Mockingbird in New England, herein set forth, suggests these conclusions, based on our own records and those of other observers who have given me theirs, as well as on published records, namely that the species has a more established foothold now and in recent years than when its very casual presence was interpreted as "accidental" or "an escape"; that in the most recent years there is evidence that it is still pushing northward the limit of its range along the coast; that the northern representation has been maintained as much, if not more, by permanent residence as by migrants moving in, although the latter, year by year, doubtless have assisted in its maintenance and increase; that now, since the taking of breeding birds and their eggs has been almost entirely checked by protective laws and an educated public sentiment, there will be likely to be a more rapid increase of this northern representation of the species in New England; that it is entirely hardy and acclimated, as much so as our hardest permanent residents; that its survival in the rigors of winter is not dependent on aid rendered by human agency, much

as that may help, but that it is likely to suffer less than hardy ground-feeding birds, because it obtains its food from the berries of shrubs and vines and the frozen fruit on trees, especially apples, which are within its reach even in the time of deepest snows; that the many records of winter resident birds, far outnumbering those of spring, summer, and fall, indicate that there are probably many nestings which do not come under observation, in which young are raised, not a few, it may be, to remain as permanent residents and increase the northern representation; that these frequent fall and winter appearances of birds not observed during the summer are due probably to their seeking shelter and food in park and village shrubbery, where they readily come under observation; that they leave these wintering places for more retired haunts when the severity of winter has passed and conditions favor their release; that this movement may be greater or less in extent, amounting even to limited migration, but more likely northward than southward in conformity with the general trend of bird movement in the spring; and that thus they appear and disappear and sometimes re-appear, not remaining throughout the year within our observation and knowledge, except in the rare case of the celibate Arnold Arboretum Mockingbird.

THE NAME OF THE EASTERN HERMIT THRUSH.

BY OUTRAM BANGS AND THOMAS E. PENARD.

FROM the earliest times there has always been much confusion in the nomenclature of our American thrushes. It is, therefore, not strange to discover, even at this late date, some slight errors which have escaped notice and have persisted through so many years. But we should hardly have expected to find a serious error in the name of our common eastern Hermit Thrush which has received so much attention from investigators. This, however, is unfortunately the case.

In Tschudi's 'Fauna Peruana', Orn., 1845-1846, p. 187, Cabanis used the name *Turdus guttatus* for the Hermit Thrush. This was

not an independent name, but merely a new combination with *Turdus*, based on *Muscicapa guttata* Pallas. Cabanis, having examined Pallas' type, which he said was in the Berlin Museum, states very explicitly, "Ich habe desshalb den Pallas' schen Speciesnamen fur diese Art beibehalten, sowohl da er älter als der von Wilson gegebene 'solitarius,' als auch weil letzterer Name schon mehrfach anderweitig in demselben Genus vergeben ist."

Later Cabanis (Archiv fur Naturg., Jahrg. 13, Bd. 1, 1847, p. 205), considering the combination *Turdus guttatus* preoccupied, substituted *Turdus pallasii*, which is thus a pure synonym of *Muscicapa guttata* Pallas, and accordingly applies to the Alaskan, not the eastern, form of the Hermit Thrush. The latter should, therefore, have a new name.

The late Doctor Walter Faxon, who sometime ago called our attention to this error in nomenclature, had intended to make the correction. It is, therefore, very appropriate that we should name the eastern form of the Hermit Thrush—

***Hylocichla guttata faxoni* subsp. nov.**

Type.—Mus. Comp. Zool., 209370 adult ♂; Shelburne, N Hampshire; 19 July, 1884; William Brewster.

Characters.—Differs from *Hylocichla guttata guttata* (Pallas), and all other western forms, in having the sides and flanks buffy brown instead of grayish or olivaceous; the upper parts browner—more isabelline or cinnamonaceous; bill relatively larger; tail relatively shorter.

Measurements.—Type, adult ♂: wing, 95 mm; tail, 67; tarsus, 30; exposed culmen, 14.

M. C. Z., 209371, topotype, adult ♀: wing, 89; tail, 62; tarsus, 29; exposed culmen, 13.

(For measurements, descriptions and details, concerning all the races of the species, see Ridgway, 'Birds of North and Middle America,' Pt. 4, 1907, pp. 39-48.)

Remarks. In the synonymy of this form we find two original names, both untenable,—*Turdus solitarius solitarius* Wilson (Amer. Orn., Vol. 5, 1812, p. 95) and *Turdus brunneus* "Gmel." Brewer (Journ. Boston Soc. Nat. Hist., Vol. 6, No. 3, 1852, p. 304). We have considered it better to accompany our new name with a diagnosis rather than to propose it as a substitute name for either of these as their history is so involved.

Turdus solitarius Wilson is preoccupied by *Turdus solitarius*

Linne, (Syst. Nat., 1758, Vol .1, p. 170 = *Monticola solitarius solitarius* (Linn.)). Wilson's first reference after the name, is to plate 43, fig. 2, in the same work. This plate represents *Hylocichla ustulata swainsonii* (Cabanis), but the description which follows undoubtedly applied to the Hermit Thrush. Wilson also refers to a specimen from the Peale Museum, No. 3542. There is in the Museum of Comparative Zoology a specimen from that source (cf. Faxon, Bull. M. C. Z., Vol. 59, No. 3, 1915, p. 147). This may be the subject of Wilson's description, but the original label has been destroyed and there is now no way of confirming this, since the plate, with which it might otherwise be compared, represents another species.

Turdus brunneus Brewer is preoccupied by *Turdus brunneus* Boddaert (Tab. Pl. Enl., 1783, p. 33, Pl. 556, Fig. 2. = *Euphagus carolinus* (Muller). Ridgway (Birds of North and Middle America, Pt. 4, 1907, p. 51, footnote) says, "The two species, *Hylocichla guttata pallasii* and *H. ustulata swainsonii* are, however, so inextricably involved in Doctor Brewer's article that it is difficult to understand which he would designate as "*Turdus brunneus* "Gmel." Instead of including the name under *H. u. swainsonii*, however, Ridgway (*loc. cit.*, p. 67) places it under *H. fuscescens fuscescens* (Stephens).

Both names, *Turdus solitarius* Wilson and *Turdus brunneus* Brewer, are thus of composite nature. A substitute name to replace either would possess the same infirmities and be open to serious objections. For this reason we have considered it best to propose an entirely independent name.

We are well aware that there is much feeling against apparently needless changes in the names of our common birds, especially of one so well known as our Hermit Thrush. It is not our purpose to discuss this phase of the question here, any more than to say that, in our opinion, the science of ornithology cannot lose, but must eventually gain, by any action, however trivial, that is founded on fundamentally sound principles.

We are indebted to Dr. Charles W. Richmond for his opinion in regard to the nomenclatural points involved.

A REVIEW OF THE GRACKLES OF THE GENUS HOLOQUISCALUS.

BY JAMES L. PETERS.

THE Grackles of the genus *Holoquiscalus* comprise several closely related species and subspecies limited in their distribution to certain islands in the West Indies and the Caribbean coast of South America.

It has always been customary to treat each one of these insular forms specifically, but I believe that the group falls naturally into four species, each with one or more geographic races, as I shall shortly endeavor to demonstrate.

The genus is not represented in the Bahamas; and there is a considerable gap in its distribution including the Virgin Islands and extending southward into the Lesser Antilles until Guadeloupe is reached; and for some inexplicable reason no representative is found on Dominica.

The Museum of Comparison Zoology is very fortunate in the quantity and quality of its West Indian material, and consequently it has not been necessary to draw on other institutions for loan of skin except to borrow a single specimen of the female of *Holoquiscalus insularis* (Richmond) from the U. S. National Museum. It has not been possible to borrow any skins of *H. orquillensis* nor have the types of *H. mexicanus* or *H. rectirostris* been seen by me.

Thanks are due to Dr. C. W. Richmond, Asso. Curator of Birds, U. S. National Museum for the loan of a female of *Holoquiscalus l. insularis*, and to Mr. T. E. Penard for verifying several references and for calling my attention to several others.

Genus *Holoquiscalus* Cassin.

Holoquiscalus was proposed by Cassin (Proc. Acad. Nat. Sci. Phila, 1866, 404) as a subgenus to include the following species at that time included in *Quiscalus*, *Q. baritus*, *Q. niger*, *Q. inflexirostris* and *Q. lugubris*. At the same time he described two other species known only from the type specimens still in the collection of the Academy of Natural Sciences of Philadelphia, viz: *Q. mexicanus* and *Q. rectirostris*.

Gray in the 'Handlist of Birds of the British Museum' (Vol. II, 1870, p. 38) followed Cassin, so did Sclater in the 'Catalogue of Birds of the British Museum' (Vol. XI, 1886, p. 394).

Ridgway in 1901 (Proc. Wash. Acad. Nat. Sci. Apr. 15, 1901, p. 151) elevated the subgenus to full generic rank and as such it has been recognized by most writers since that time, although many European ornithologists still cling to *Quiscalus* for this group.

Holoquiscalus is a remarkably even genus as far as external characters show. There is more or less variation in the shape of the bill, but nothing sufficiently great to warrant the creation of even sub-genera. In two species the females are different from the males in color, the young males passing through the plumage of the female before assuming that of the adult.

The shape of the palatal keel shows some variation; the general type exhibited is that of a compressed median ridge lowering posteriorly, there becoming broad, rounded, but sharper anteriorly. It is in the height of the anterior portion and in the angle there formed with the palate that any variation occurs. Suitable alcoholic material is necessary however, to determine the variation in the different forms.

Nearly all authors speak of the peculiar shape of the tail in flight; it is expanded vertically to a depth of three or four inches. I am rather inclined to believe that this plication may be permanent in all the species; from experience with birds in the flesh I know it to be so in *H. j. gundlachii* and *H. n. niger*.

A key to the species and subspecies does not bring out the relationships, and for this reason the following diagnosis is appended to make clear my point.

Holoquiscalus jamaicensis and subspecies. Moderate sized Quiscalinae the body brilliant glossy violet black or steel blue; females similar to the males but smaller, gloss less brilliant but present.

Holoquiscalus niger and subspecies. Averaging smaller than *H. jamaicensis*; the body glossy black; females similar but smaller and duller.

Holoquiscalus lugubris and subspecies. Rather small Quiscalinae, the males resembling *H. jamaicensis* in color; females dark smokey brown above, lighter below, becoming almost white on the throat.

Holoquiscalus fortirostris and subspecies. Males similar to the corresponding sex of *H. lugubris* but smaller; females similar to the males but smaller, the metallic gloss much duller and washed with deep sooty brown.

***Holoquiscalus jamaicensis jamaicensis*, (DAUDIN).**

- Monedula tota nigra* SLOAN, Jamaica 2, p. 299, pl. 257, f. 2, 1725.
Merops niger, iride subargentea, BROWN, Jamaica, p. 476, 1756.
Pica jamaicensis, BRISSON, Orn., 2, p. 41, 1760.
 Boat-tailed Grackle, LATHAM, Syn. 1, 2, p. 460, n. 5, t. 18, 1782.
 [Gracula] *barila*, LINN., Syst. Nat. ed. 12, 1, p. 165, 1766.—GMEL, Syst. Nat. 1, 1788, p. 396.—WAGLER, Syst. Av., 1827.
Quiscalus baritus, VIEILLOT, Nouv. Dict. d'Hist. Nat. 28, 1819, p. 487.—CASSIN, Proc. Acad. Nat. Sci., Phila., p. 405, 1866.
 [Quiscalus] *baritus*. BONAPARTE, Consp. Av. 1, 1850 p. 425.—GRAY H. L., Birds Br. Mus. 2, 1870, p. 38.
 [Quiscalus *baritus*] var. *baritus*, BAIRD, BREWER & RIDGWAY Hist. N. Am. Bird. 2, 1874, p. 213.
Sturnus barila, DAUDIN, Traité d'Orn., 2, 1800, p. 320.
Sturnus jamaicensis, DAUDIN, Traité d'Orn. 2, 1800, p. 317.
Quiscalus crassirostris, SWAINSON, Anim. in Menag, 1838. p. 355.
 GOSSE, Birds Jan., 1847, p. 217; Ills. Birds Jan., 1849, pl. 53.—SCLATER Cat. of Am. Birds, 1862 p. 359.—ALBRECHT, J. & O., 1862, p. 197.—MARCH, Proc. Acad. Nat. Sci., Phila., 1863, p. 298.—SCLATER, Ibis, 1884, p. 159; Cat. Birds Br. Mus. 11, 1886, p. 398.—CORY, Auk, 3, 1886, p. 225; Birds of the W. I., 1889, p. 111; Cat. W. I. Birds, 1892, p. 15, 111, 130.—SCOTT, Auk, 10, 1893, p. 179.—FIELD, Auk, 11, 1894, p. 126.—NICOLL, Ibis, 8th ser. 4, 1904, p. 577.—MAYNARD, Birds of the W. I., 1901, p. 19.—SCLATER, Handbook of Jamaica, 1910 (Reprinted, p. 2).
 [Quiscalus] *crassirostris*, BONAPARTE, Consp. Av. 1, 1850, p. 425.—GRAY, Gen. Birds, 1845, p. 341; (A. & E.) NEWTON, Handbook Jam., 1881, p. 103.
 [Quiscalus] *crassirostris* SCLATER & SALVIN, Nom. Av. Neo., 1873, p. 38.—CORY, Birds of the W. I., 1885, p. 14; do, rev. ed., 1886, p. 14.
 [Quiscalus] *vulgaris* TEMMINCK, Table Méth., 1838, 10.
Sc[aphedurus] crassirostris BONAPARTE, Consp. Av. 1, 1850, p. 426.
Holoquiscalus jamaicensis RIDGWAY, Proc. Wash. Acad. Sci. 3, Apr. 15, 1901, p. 151; Birds of N. & M. Am. (Bull 50, U. S. N. M.) 2, 1902, p. 227.—SHARPE, H. L. of Birds, 5, 1909, p. 509.
Holoquiscalus jamaicensis jamaicensis TODD, Ann. Carn. Mus. 10, Jan. 31, 1916, 280.—BANGS & KENNARD, Handbook of Jamaica, 1920.
Description.—Adult male: above and below glossy violet black, the abdomen and upper and lower tail coverts inclining to steely blue, shading into greenish at the tips; wing coverts bronze-green, the lesser series

tipped with steel-blue or purplish; upper surface of the quills glossed with greenish bronze, particularly on the secondaries; under surface of quills dull black; shafts black. Wing, 146.5–151 mm. (148.8); tail, 135.5–143 mm. (136.67); bill (from base), 31.5–34.5 mm. (33.66).

Adult female: Similar to the male but smaller, the violaceous gloss less brilliant and frequently with a distinct steel-blue suffusion; rump and upper tail coverts usually with this color predominating; abdomen dull black. Wing, 124–133 mm.; tail, 115–130 mm.; bill (from base), 29–30.5. Bill and feet black; iris "cream-white" (Gosse).

Type locality.—Jamaica.

Range.—Island of Jamaica, West Indies.

Material.—Eighteen skins, all adults, 11 males and 7 females, all in the Museum of Comparative Zoology.

Remarks. The history of this form goes back to the first half of the 18th century. As early as 1725 Sir Hans Sloan describes and figures¹ a bird presumably of this species, but as his description is insufficient and his figure barely recognizable as that of a bird his species cannot be identified with any degree of certainty. Dr. Patrick Brown in his account of Jamaica² furnishes a somewhat meagre, albeit quite recognizable description of the form now under consideration under the caption, of "*Merops niger, iride subargentea*." Brisson bases his *Pica jamaicensis* on Brown. [*Gracula*] *barita* of the 10th edition of Linnaeus is founded on Rolander, no references are given and there are several discrepancies in the description. Whatever the bird of the 10th edition may be it is not the Jamaican bird and should not be included in its synonymy. In the 12th edition however references are given to Sloan and to *Icterus niger* of Brisson, completely changing the status of the name "*barita*."

The name which this species now bears was given by Daudin in 1800, based on Brown's "*Merops niger, iride subargentea*," a name however which was not generally used until set up by Ridgway (Proc. Wash. Acad. Sci. 3, Apr. 15, 1901, p. 151) the name *crassirostris* given by Swainson in 1838, (Anim. Menag. p. 355) having been in general use by most authors up to 1901.

¹ A voyage to the islands of Madeira, Barbadoes Nieves, St. Christopher and Jamaica with the Natural History of the herbs and trees, four-footed beasts, fishes, birds, insects, etc. of the last of these islands, Sloan H., 1707, London

² The Civil and Natural History of Jamaica, Brown, Patrick, 1766, London.

***Holoquiscalus jamaicensis gundlachi* (CASSIN)**

- Quiscalus versicolor* (not of Vieillot) VIGORS,¹ Zool. Journ. 3, no. 11, 1827, 442.
- Q[uisicalus] versicolor* (not of Vieillot) LEMBEYE,¹ Aves de la Isla de Cuba, 1850, 131.
- Quiscalus barytus* (not *Gracula barita* Linn.) D'ORBIGNY¹ in La Sagras Hist. Nat. De Cuba, Ois. 1839, 120, pl. 18².
- Quiscalus baritus* (not *Gracula barita* Linn.) THIENEMAN.¹ J. f. O. 1857 151.
- Q[uisicalus] Barytus* (not of Linn.) LEMBEYE,¹ Aves de la Isla de Cuba, 1850, 131.
- Chalcophanes baritus* (not of Linn.) GUNDLACH¹, J. f. O., 1856, 15.
- Ch[alcophanes] baritus* CABANIS,¹ Mus. Hein. 1, Sept., 1851, 197 (excl. syn.)
- Calcophanes baritus* (not of Linn.) BREWER,¹ Proc. Bost. Soc. Nat. Hist., 1860, 307.
- Quiscalus gundlachi* CASSIN, Proc. Acad. Nat. Sci., Phila., 1866, 406.—CORY,¹ Auk 3, 1886, 226.—SCLATER,¹ Cat. Birds Br. Mus. 11, 1886, 398.—CORY, Birds of the W. I.¹, 1889, 113; Cat. W. I. Birds,¹ 1892, 15, 111, 129, 147.—STONE, Proc. Acad. Nat. Sci., Phila., 1899, 35.—MAYNARD,¹ Cat. Birds W. I., 1903, 19.
- [Quiscalus gundlachi] [=ii]* GUNDLACH,¹ Orn. Cub., 1895, 124.
- [Quiscalus] gundlachi* GRAY,¹ H. L. 2, 1870, 38, no. 6257.
- [Quiscalus baritus]* var. *Gundlachi*, BAIRD, BREWER & RIDGWAY,¹ Hist. No. Am. Birds, 2, 1874, 213.
- [Quiscalus] gundlachi*, CORY, Birds of the W. I., 1885, 14¹ (rev. ed., 1886, 14¹).
- Quiscalus gundlachi* SCLATER,¹ Ibis, 1884, 159.—CHAPMAN, Bull. Am. Mus. Nat. Hist., 1892, 306 (Trinidad, Cuba).
- Chalcophanes gundlachi* GUNDLACH,¹ J. f. O. 1874, 135; Orn. Cub.¹, 1876, 102.
- [Chalcophanes] gundlachi* GUNDLACH,¹ Sup. Orn. Cub., 1876, 270.
- Holoquiscalus gundlachi* RIDGWAY,¹ Proc. Wash. Acad. Sci. 3, April 15, 1901, 151; Birds No. & Mid. Am.¹ 2, 1902, 224, 226, part (Cuba).
- Holoquiscalus gundlachi* MENEGAUX,¹ Bull. Mus. Nat. de France, 1909, 237.—SHARPE,¹ H.-L. of Birds, 1909, 509, part (Cuba).
- Holoquiscalus jamaicensis gundlachi* TODD, Ann. Carn. Mus. 10, nos. 1 & 2, Jan. 31, 1916, 280.

Description.—Adult male: Similar to *H. j. jamaicensis*, but violaceous gloss somewhat more intense and extending farther on the underparts. Slightly smaller, bill longer and more slender. Wing, 144–155 mm. (147.5); tail, 132.5–143 mm. (136.1); bill (from base), 34–37.5 mm. (36). Adult female: Similar to the male but smaller; gloss less brilliant and

¹ These references may refer either to *H. j. gundlachi* or to *H. j. caribaeus*.

² This plate is not certainly identifiable.

inclining to steel blue. Wing, 124.5–132 mm. (127.9); tail, 118–129 mm. (121.9); bill (from base), 29–31 mm. (30.6).

The female of this species may be distinguished from that of the preceding by smaller size, and longer and more slender bill. Bill, legs and feet, black; iris, yellow.

Type locality.—Eastern Cuba.

Range.—Eastern Cuba (Nipe Bay Region,¹ Holquin,² Guantanamo,² Guanaja,³ Baracoa³) and Central Cuba (Remedios¹ & Trinidad²).

Material.—20 specimens, 11 males, 9 females, all in Museum of Comparative Zoology.

Remarks. There are very few references in literature to Gundlach's Grackle prior to 1866 when Cassin described it as distinct and all these references were either to *Quiscalus versicolor* of Vieillot (= *Quiscalus quiscula* subsp?) or to *Quiscalus baritus* (= *Gracula barita* Linn.) a blanketname for all birds of this genus (*Holoquiscalus*) but which has no applicability whatever to birds from Cuba.

In 1916 Todd described as subspecifically distinct the bird from western Cuba and the Isle of Pines and in his paper determined the type locality of *gundlachii* to be eastern Cuba.

Intergradation between the eastern and western races is perfect; a male from eastern Cuba approaches *caribaeus* and two males from western Cuba approach *gundlachii*.

***Holoquiscalus jamaicensis caribaeus* (Todd)**

Quiscalus versicolor (not of Vieillot) VIGORS,³ Zool. Journ. 3, no. 11, 1827, 442.

Q[uscalus] versicolor (not of Vieillot) LEMBEYE,³ Av. de l' Isl. de Cuba, 1850, 131.

Quiscalus barytus (not *Gracula barita* Linn.) D'ORBIGNY³ in La Sagra's Hist. Nat. Cuba Ois., 1839, 120, pl. 18⁴; Poey in Hist. Nat. de Cuba, pt. 38, June, 1854, 426–427 (Isle of Pines).

Quiscalus baritus (not *Gracula barita* Linn.) THIENEMANN,³ J. f. O., 1857, 151.

Q[uscalus] Barytus (not *Gracula barita* Linn.) LEMBEYE,³ Ave d. l. Isla de Cuba, 1850, 131.

Chalcophanes baritus (not *Gracula barita* Linn.) GUNDLACH,³ J. f. O., 1856, 15.

Ch[alcophanes] baritus CABANIS,³ Mus. Hein. 1, Sept., 1851, 197 (excl. syn.)

¹ Specimens from these localities in M. C. Z.

² Todd, Am. Cam. Mus. 10, no. 1 & 2, 1916, 278.

³ References so marked may refer either to *H j. gundlachii* or to *H j. caribaeus*.

⁴ This plate is not certainly identifiable.

- Calcophanes baritus* BREWER,¹ Proc. B. S. N. H. 7, 1860, 307.
- Quiscalus gundlachii* CORY,¹ Auk 3, 1886, 226.—SCLATER,¹ Cat. Bird Br. Mus., 11, 1886, 398.—CORY,¹ Birds of the W. I., 1889, 113; Cat. W. I. Birds,¹ 1892, 15, 111, 129, 147 part (Cuba).—GUNDLACH,¹ Orn. Cub., 1895, 124.—MAYNARD,¹ Cat. Birds W. I., 1903, 19.
- [*Quiscalus*] *gundlachii*, GRAY¹ H. L. 2, 1870, 38, no. 6257.
- [*Quiscalus baritus*] var. *gundlachi* BAIRD, BREWER & RIDGWAY,¹ Hist. N. Am. Birds, 2, 1874, 213.
- [*Quiscalus*] *gundlachi* CORY,¹ Birds of the W. I., 1885, 14 (do' rev. ed., 1886, 14).
- Quiscalus gundlachi*¹ SCLATER, Ibis, 1884, 159.
- Chalcophanes gundlachii*¹ GUNDLACH, J. f. O., 1874, 135; Orn. Cub.¹, 1876, 102.
- Holoquiscalus gundlachii* RIDGWAY,¹ Proc. Wash. Acad. Sci. 3, Apr. 15, 1901, 151; Birds, N & M. Am. 2, 1902, 227 part (Cuba).
- Holoquiscalus gundlachii* (not of Cassin) BANGS & ZAPPEY, Am. Nat. 39, 1905, 211 (Isle of Pines).
- Holoquiscalus Gundlachi* MENEGAUX,¹ Bull. Mus. Nat. de France, 1909, 237.
- Holoquiscalus gundlachi* SHARPE,¹ H.-L. of Birds, 1909, 509, part (Cuba & Isle of Pines).
- Holoquiscalus caymanensis dispar* (not of Clark!) TODD, Ann. Carn. Mus. 10, nos. 1 & 2, Jan. 31, 1916, 276.
- Holoquiscalus caymanensis caribaeus* TODD, do, erratum insert opp. p. 276, nom. nov. for *dispar* preoccupied.
- Description*.—Adult male: Similar to *H. j. gundlachii*, but smaller; the gloss with steel blue sheen predominating; in some specimens all trace of violaceous is lacking.
- Wing, 137–146 (140.5) mm.; tail, 121–136 (127.8) mm.; culmen (from base of forehead), 32.5–37 (34.55) mm. Adult female: similar to the male but smaller and less brilliantly glossed. Differs from the female of the foregoing in being smaller and with steel blue gloss much more pronounced.
- Wing, 122–128 (125.25) mm.; tail, 109.5–116.5 (112.75) mm.; culmen (from base of forehead), 29.5–31.5 (30.7) mm. Bill, legs and feet black. Iris cream (Zappey, on label).
- Type locality*.—Nueva Gerona, Isle of Pines.
- Range*.—Western Cuba (Bolandron, Cojimar, Pinar del Rio, Marianao, El Guama) and Isle of Pines.
- Material*.—25 skins, 16 males and 9 females, all in Museum of Comparative Zoology.
- Remarks*.—Although Bangs and Zappey (Am. Nat. 39, 1905, 211) pointed out some differences between the Isle of Pines and

¹ References so marked may refer either to *H. j. gundlachii* or to *H. j. caribaeus*.

Cuban grackles, the true status of the relationships was not made clear until established by Todd (Ann. Carn. Mus. 10, 1 & 2, 1916, 276.) a few years ago. The large violet-shaded males of eastern Cuba are recognizable at a glance from the steel-blue birds from western Cuba and the Isle of Pines. The difference between the females is less striking but nevertheless quite pronounced.

There are very few cases in the literature that can be definitely linked up with either race; most of them refer merely to "Cuba" and such references must be quoted in the synonymy of both races with a query. Only when the reference is contained in a local list can the identity of a particular form be definitely established.

***Holoquiscalus jamaicensis bangsi*, subsp. nov**

Quiscalus gundlachi (not of Cassin) CORY, Auk 6, 1889, 31. (Cayman Brac).—NICOLL, Ibis, 8th ser., 4, 1904, 587.

Quiscalus gundlachi CORY, Cat. Birds of the W. I., 1892, 111, 147 (Excl. Cuba).

Holoquiscalus gundlachii RIDGWAY, Birds of N. & M. Am. 2, 1902, 226 (excl. Cuba and Isle of Pines).

Holoquiscalus gundlachi LOWE, Ibis, 9th ser., 5, 1911, p. 161.

Holoquiscalus caymanensis caribaeus (not of Todd) BANGS, Bull. M. C. Z. 60, no. 7, March, 1916, 317.

Type.—No. 68025, Museum of Comparative Zoology, adult male, Cayman Brac, West Indies, collected June 28, 1911, by W. W. Brown, Jr.

Subspecific characters.—Similar to *H. j. jamaicensis* (Daudin) but smaller; bill longer and fully as stout; violaceous gloss less brilliant, the steel blue tinge on the abdomen extending to the lower breast; throat faintly washed with blue; upper parts with an almost imperceptible bluish tinge.

Measurements (in millimeters).—

No. M.C.Z.	Sex	Locality	Wing	Tail	Culmen (from base of forehead)
68025	♂	Cayman Brac.	147	130	35.
68024	♂	" "	143	127	35
68023	♂	" "	147	134	36
36484	♂	Little Cayman	141	126	39
68014	♂	Little Cayman	145	135.	34
68017	♂	" "	146.5	135.5	33
68018	♂	" "	144.5	130.	35.5
Average		7 adult males	145.	130.95	35.35

No. M. C. Z.	Sex	Locality	Wing	Tail	Culmen (from base of forehead)
36483	♀	Cayman Brac.	121	109	31
68028	♀	" "	129	112	31
68029	♀	" "	125	118.5	31
68030	♀	" "	121	109	31
68020	♀	Little Cayman	128	123	32
68021	♀	" "	124	110.5	30.5
68022	♀	" "	124	118.5	31
72097	♀	" "	118	107	31.5
Average			124.8	113.43	31.12
8 adult females					

Females are similar to the males but very faintly glossed, often with a brownish wash on the under-parts and a trace of greenish bronze on the forehead. Bill, feet, and legs black.

Range.—Islands of Little Cayman and Cayman Brac, W. I.

Material.—Eighteen specimens; 10 males and 8 females, all in the Museum of Comparative Zoology.

Remarks.—Grackles from these two islands have until quite recently been referred to *gundlachii*. When Bangs was working up a collection of birds made in the Caymans by W. W. Brown he noticed the difference in birds from Little Cayman and Cayman Brac and had the species in manuscript when Todd's paper on the birds of the Isle of Pines came out. At the time he was correcting the proof of his paper and having no time to look into the matter, provisionally referred his bird to the Isle of Pines Grackle.

***Holoquiscalus jamaicensis caymanensis* (CORY)**

Quiscalus caymanensis CORY, Auk, 3 1886, 499, 502.—RIDGWAY, Proc. U. S. Nat. Mus. 10, 1887, 574.—CORY, Auk, 5, 1888, 158; Birds of the W. I., 1889, 291; Cat. W. I. Birds, 1892, 15, 111, 129, 147.—MAYNARD Cat. Birds of the W. I., Dec. 1, 1903, 19.—NICOLL, Ibis, 8th Ser., 4, 1904, 581.

Holoquiscalus caymanensis RIDGWAY, Proc. Wash. Acad. Sci., 3, Apr. 15, 1901, 151; Birds of N. & M. America, 2, 1902, 224, 229.—SHARPE H. L. of Birds, 5, 1909, 510.—LOWE, Ibis, 9th Ser., 3, 1909, 347, 5, 1911, 143, 161.

Holoquiscalus caymanensis caymanensis TODD, Ann. Carn. Mus. 10, nos. 1 & 2, Jan. 31, 1916, 277, 280, Bangs, Bull. M. C. Z. 60, No. 7, March 1916, 317.

Description.—Adult male: Similar to *H. j. caribaeus* but much smaller, the bluish gloss with a purplish tinge.

Wing, 128–136 (130) mm.; tail, 112.5–118 (116.4) mm.; culmen (from base of forehead), 31–34 (32.87) mm.

Adult female: Similar to the male but smaller and duller colored, underparts washed with brown. Wing, 114.5 mm.; tail, 99.5 mm.; culmen (from base of forehead), 28.5 mm. Bill, legs, and feet black; iris yellow (Richardson on label).

Type locality.—Island of Grand Cayman, W. I.

Range.—The same.

Material.—6 specimens, 4 adult and 1 young male, 1 adult female, all in the collection of the Museum of Comparative Zoology.

Remarks.—The Great Cayman Grackle is the smallest of any of the Greater Antillean forms and this character combined with a very slender bill serve at once to identify it.

Holoquiscalus niger niger (BODDAERT)

Icterus niger BRISSON, Ois. 2, 1760, 103 (Excl. pl. & fig.).—Le Troupiale noir, Buffon, Hist. Nat. des Ois. 3 (excl. refs. to Jamaica).

Oriolus niger BODDAERT, Table. Pl. Elumn. 1753, 31 (based on Le Troupiale noir de St. Domingue, Daubenton Pl. enl. pl. 534).—LATHAM, Ind. Orn. 1, 1790, 185.

Icterus niger TEMMINCK, Cat. Syst., 1807, 48.

[Agelaius] niger VIEILLOT, Enc. Meth. 2, 1823, 718.

Quiscalus niger CASSIN, Proc. Acad. Nat. Sci., Phila., 1866, 407.—SCLATER, Ibis, 1884, 159; Cat. Birds Br. Mus. 11, 1886, 398.—CORY, Birds of Haiti & San. Dom., 1885, 73, pl. 22, f. 1; Auk, 3, 1886, 226; Birds of the W. I., 1889, 113; Cat. W. I. Birds, 1892, 15, 111, 131.—CHERRIE, Field Col. Mus. Orn. Series 1, 1896, 17.—MAYNARD, Birds of the W. I., 1903, 20; A. E. & A. H. VERRILL, Proc. Acad. Nat. Sci., Phila. 61 1909, 362.

[Quiscalus] niger GRAY, H.-L., 2, 1870, 38, no. 6529.—CORY, Birds of the W. I., 1885, p. 14; do, rev. ed. 1886, 14.

[Quiscalus barilus] var. *niger* BAIRD, BREWER & RIDGWAY, Hist. No. Am. Birds, 2, 1874, 213.

Holoquiscalus niger RIDGWAY, Proc. Wash. Acad. Sci., Apr. 15, 1901, 151; Birds No. & Mid. Am. 2, 1902, 225, 228.—SHARPE, H.-L. 5, 1909, 509.—PETERS, Bull. M. C. Z. 61, no. 11, Oct., 1917, 424.

Holoquiscalus niger niger TODD, Ann. Carn. Mus. 10, nos. 1 & 2, Jan. 31, 1916, 280.

Quiscalus ater "Baird" BRYANT, Proc. Bost. Soc. Nat. Hist. 11, 1866, 94.—CORY Bull. N. O. C., 6, 1881, 153.—TRISTRAM, Ibis, 1884, 168.

Quiscalus barita "Gm" Sclater, P. Z. S. 1857, 232.

Quiscalus sp? A. E. & A. H. Berrill, Proc. Acad. Nat. Sci. Phila., 61, 1909, 362.

Description.—Adult male: uniform glossy black strongly washed on the rump and upper tail coverts with violaceous; retrices and secondaries externally glossed with dark greenish bronze. Wing, 126–142 (130.8) mm.; tail, 111–127.5 (118.6) mm.; culmen (from base of forehead), 31.5–34 (32.5) mm.

Adult female: similar to the male but smaller. Wing, 113.5–119.5 (118.2) mm. tail, 103–112 (107.4) mm.; culmen (from base of forehead), 29–31 (29.7) mm. Bill, legs and feet black; iris lemon yellow.

Type locality.—Island of Haiti. There can be little doubt that the original specimen which served as Daubenton's model for his plate of *Le Troupiale Noir de St. Domingue* came from the western end of the Island which at that time was a French colony. I, therefore, designate Port au Prince, Republic of Haiti, as the type locality of *Holoquiscalus niger niger*.

Range.—Island of Haiti (Republics of Haiti and Santo Domingo), Islands of Gonave (?) and Tortuga (?).

Material.—Eighteen adults, nine males and nine females, all in the collection of the Museum of Comparative Zoology.

Remarks.—The Haitian Grackle is the smallest of any of the Greater Antillean forms. The strong violaceous or bluish gloss of *H. jamaicensis* and its allies is lacking; the bill moderate and almost straight. Early writers confused this species with the Jamaica bird. Brisson's *Icterus niger* is given as inhabiting "St. Domingue et Jamaica;" whatever his description may refer to his plate is almost certainly the stout billed Jamaican Grackle. Buffon likewise attributes the species to Haiti and Jamaica, adding to his text under the *Troupiale noir* that this bird is the same as *Icterus niger* of Brisson.

***Holoquiscalus niger brachypterus* (CASSIN)**

Quiscalus baritus (not *Gracula barita* Linn.) TAYLOR, *Ibis*, 1864, 168 (part).

Quiscalus crassirostris (not of Swainson) BRYANT, *Proc. B. S. N. H.* 10, 1866, 254.—GUNDLACH, *J. f. O.*, 1866, 188.—SUNDEVALL, *Öfv. K. Vet-Akad. Förh. Stock.* 1869, 598.

Quiscalus brachypterus CASSIN, *Proc. Acad. Nat. Sci. Phila.*, 18, 1866, 406.—SCLATER, *Ibis*, 1884, 160; *Cat. Birds Br. Mus.*, 11, 1886, 399.—CORY, *Auk*, 3, 1886, 224; *Birds of the W. I.*, 1889, 111; *Cat. Birds of the W. I.* 1892, 15, 111, 132.—MAYNARD, *Cat. Birds of the W. I.*, 1903, 19.—BOWDISH, *Auk*, 19, 1903, 12.

[*Quiscalus*] *brachypterus* GRAY, *H.-L.* 2, 1870, 38, no. 6528.—CORY, *List of the Birds of the W. I.*, 1885, 14; rev. ed., 1886, 14.—SCLATER & SALVIN, *Nom. Av. Neo.*, 1873, 38.

[*Quiscalus baritus*] var. *brachypterus* BAIRD, BREWER & RIDGWAY, *Hist. No. Am. Birds*, 2, 1874, 213.

Chalcophanes brachypterus GUNDLACH, J. f. O., 1874, 312; 1878, 177; *Anal Soc. Esp. Hist. Nat.* 7, 1878, 213.

Holoquiscalus brachypterus RIDGWAY, *Proc. Wash. Acad. Sci.*, 3, Apr. 15, 1901, 151; *Birds of No. & Mid. Am.*, 2, 1902, 224, 228.—SHARPE, H.-L. of *Birds*, 5, 1909, 509.—WETMORE, *Bull.* 326, U. S. Dept. Agriculture March 24, 1916, 5, 7, 9, 10, 11, 117; *Auk*, 33, 1916, 407, 419; 34, 1917, 54, 62.

Holoquiscalus niger brachypterus TODD., *Ann. Carn. Mus.* 10, nos. 1 & 2, 280.

Description.—Adult male: similar to *H. n. niger*, but slightly larger; more conspicuously glossed; bill stouter and strongly decurved terminally. Wing, 131.5–137 (133.8) mm.; tail, 114–130 (124.3) mm.; culmen, 31–34 (32.5) mm.

Adult female: similar to the male but smaller. Wing, 108.5–113 (110.8) mm.; tail, 103–108 (105) mm.; culmen, 27.5–29 (28.25) mm. Bill, legs and feet black; iris yellow.

Type locality.—North side of Porto Rico.

Range.—Islands of Porto Rico, Vieques, and Cubebra, W. I.

Remarks.—The Porto Rican Grackle is the last of the Greater Antillean forms; while reaching Cubebra¹ and Vieques² it does not extend its range to the other islands of the Virgin Group lying within view a short sail to the eastward; neither are there records for any other form of *Holoquiscalus* until Guadeloupe is reached, thus the gap includes the Virgin Islands (St. Thomas, St. Croix, St. John, Tortola, Virgin Gorda, Anegada and lesser islands and Cays) Sombrero, Saba, St. Eustacius, Anguilla, St. Martin, Barbuda, Antigua, St. Kitts, Nevis, Redonda and Montserrat.

Holoquiscalus lugubris lugubris (SWAINSON)

?[*Gracula*] *barila* LINN. *Syst. Nat. ed.*, 10, 1758, 109.

Quiscalus lugubris SWAINSON, *Anim. in Menag.* 1838, 299.—BURM, *Syst. Ueb.* 3, 1856, 283.—TAYLOR, *Ibis*, 6, 1864, 84.—CASSIN, *Proc. Acad. Nat. Sci., Phila.*, 1866, 408.—SCLATER, *Cat. Am. Birds*, 1862, 141; *Ibis*, 1884, 162; *Cat. Birds Br. Mus.*, 11, 1886, 402.—CHAPMAN, *Bull. Am. Mus. N. H.*, 6, 1894, 37.—PHELPS, *Auk*, 14, 1897, 364.—BERLEPSCH & HARTERT, *Nov. Zool.*, 9, 1902, 33.—HELLMAYR, *Nov. Zool.* 13, 1906, 21.—BERLEPSCH, *Nov. Zool.*, 15, 1908, 124.

[*Quiscalus*] *lugubris* BONAPARTE, *Consp. Av.*, 1, 1850, 424, 38.—PENARD & PENARD, *De Vog. v. Guyana*, 2, 1910, 380.

[*Quiscalus*] *lugubris* SCLATER & SALVIN, *Nom. Av. Neot.*, 1873, 38.—GRAY, *H.-L.*, 2, 1870, 38, no. 6526.

¹ Wetmore, *Auk* 33: 1910, 419.

² *Ibid.* 34: 1917, 62.

Chalcophanes lugubris FINSCH, P. Z. S., 1870, 577.

Ch[alcophanes] lugubris CABANIS, Mus. Hein., 1, 1851, 197.

Holoquiscalus lugubris RIDGWAY, Proc. Wash. Acad. Sci., 3, Apr. 15, 1901, 151; Birds No. & Mid. Am. 2, 1902, 225.—SHARPE, H.-L. 1909, 510.—BRABOURNE & CHUBB, The Birds of S. A., 1 (all published), Dec., 1912, 440.—CHERRIE, Bklyn. Inst. Mus. Sci. Bull., 2 (6), 1916, 211.

Ch[alcophanes] jamaicensis (not of Daudin) [=♂] CABANIS in Schomburgk's Reise, 3, 1848 (= 1849!) 683.

Ch[alcophanes] minor [=♀] do.; Mus. Hein., 1851, 197.

Quiscalus barila LEOTAUD, Ois Trin., 1860, 268.

Quiscalus sp.? TAYLOR, Ibis 6, 1864, 84 (Br. Guiana).

Description.—Adult male: In general form and coloration resembling the adult males of *H. j. jamaicensis* but much smaller with more slender and decurved bill. Above and below glossy violet black becoming bluish on the greater and median series of wing coverts; secondaries, retrices and exposed margins of primaries strongly glossed with bronze-green. Wing, 112.5–122 (117.25) mm.; tail, 106–115 (110) mm.; culmen (from base of forehead), 29–30 (29.5) mm.

Adult female: Above dark smokey brown becoming sooty on the rump and upper tail coverts; quills blackish brown faintly glossed with greenish. Below light smoky-brown becoming blackish on the flanks and undertail coverts and shading into grayish brown on the throat. Bill, legs and feet black; iris pale yellow. (Berl. & Hart. Nov. Zool. 9, 1902, 33.)

Type locality.—"Brazil", Swainson. British Guiana substituted as type locality in place of Brazil by Berlepsch and Hartert, Nov. Zool., 9, 1902, 33, foot-note.

Range.—Trinidad & Tobago, French, British & Dutch Guiana, Venezuela.

Remarks.—It is possible though by no means certain that this is *Gracula barila* of the 10th edition of Linnaeus. In this edition Linnaeus first used the name for a bird based on Dr. Rolander, there are no references to any published works or plates, and the description has various discrepancies; the range given is "America," a rather large one but somewhat restricted by the statement that the bird devours bananas. It can be still further restricted when we know that Rolander visited Surinam and St. Eustatius. Rather than resurrect this old name of doubtful application, the use of which by early authors together with *Gracula barila* of the 12th edition has produced much confusion, I prefer to follow all recent authors in the employment of Swainson's name *lugubris*.

The type-locality "Brazil," given by Swainson was doubtless

an error and Berlepsch and Hartert¹ are quite right in substituting British Guiana. Hellmayr² in 1906 also substituted British Guiana for Brazil, a proceeding which was rendered unnecessary by reason of its having been done four years before.

***Holoquiscalus lugubris insularis* (RICHMOND)**

Quiscalus insularis RICHMOND, Proc. U. S. Nat. Mus., 18, 1895, 675.—CLARK, Auk, 19, 1902, 265.—LOWE, Ibis, 9th ser., 1, 1907, 570.

Holoquiscalus insularis RIDGWAY, Proc. Wash. Acad. Sci., 3, Apr. 15, 1901, 151; Birds No. & Mid. Am., 2, 1902, 225.—CORY, Field Col. Mus., Orn. Ser. 1 (5) 231 (Los Testigos) 248 (Margarita Id.)—SHARPE, H.-L. of Birds 5, 1909, 510.—BRABOURNE & CHUBB, Birds of S. A. 1 Dec. 1912, 440.

Holoquiscalus luminosus (not of Lawrence) LOWE, Ibis, 9th ser. 3 1909, 321.

Adult male: Similar to *H. l. lugubris* but larger. Wing, 125 mm.; tail, 120 mm.; culmen (from base of forehead), 32 mm.

Adult female: Similar to adult female of *H. l. lugubris* but larger. Wing, 104 mm.; tail, 88.5 mm.; culmen, 27.25 mm. Feet, legs and bill black; iris pale yellow (Robinson on label).

Type locality.—Margarita Id., Coast of Venezuela.

Range.—Margarita Id., Los Testigos Ids.

Material.—Two specimens, 1 adult ♂, 1 adult ♀.³

Remarks.—The Margarita Grackle is an insular race with rather limited distribution. Lowe refers birds from the Testigos to *H. l. luminosus* with the remark that they are identical with Grenada birds, but Cory refers them to *insularis*, stating that they are somewhat intermediate. In all probability birds from the Testigos would be more nearly related to the Margarita form.

***Holoquiscalus lugubris orquillensis* (CORY)**

Holoquiscalus orquillensis CORY, Field Col. Mus., Orn. Ser., 1 (5), 227 (diagnosis), 254 (distribution).

Holoquiscalus insularis (not of Richmond) LOWE, Ibis, 9th ser., 3, 1909, 321.

Adult male:⁴ "Similar to *H. insularis* from Margarita, but differs in having the middle tail feathers almost plain black, not decidedly glossed with green as in that species; rest of the tail feathers showing a slight greenish gloss but much less than in *insularis*. The single female taken

¹ Nov. Zool. 9, 1902, 33. Footnote

² Nov. Zool. 13, 1906, 21,

³ No. 151, 732, coll. U. S. N. M.

⁴ Quoted from original description.

apparently does not differ from specimens from Margarita. Wing, 118.3; tail, 105; ex. culmen 26.7."

Type locality.—Orquilla (Los Hermanos Ids.), Caribbean Sea.

Range.—Orquilla.

Material.—No specimens of this race seen by me.

Remarks.—Lowe records eight specimens of this race taken on Orquilla during January, 1908, and gives the following measurements. Five males: wing 118 mm. tail 95 mm, exp. culm, 27. mm. Three females: wing 102 mm., tail 83 mm., exp. culm. 23 mm.

***Holoquiscalus lugubris luminosus* (LAWRENCE)**

Quiscalus luminosus LAWRENCE, Ann. N. Y. Acad. Sci., 1, July, 1878, 162; Proc. U. S. Nat. Mus. 1, 1879, 270, 278, 487, 9; 1886, 615.—OBER, Camps in the Caribbees, 1880, 247.—SCLATER, Ibis, 1884, 161; Cat. Birds Br. Mus 11, 1886, 225.—CORY, Auk, 3, 1886, 225; Birds of the W. I., 1889, 111; Cat. of W. I. Birds 1892, 15 —WELLS, Auk. 19 1902 346; H.-B. of Grenada, 1904, 147 (Grenada), 150. (Carriacou), reprinted (posth.) H.-B. of Grenada, 1907, 151, 154, 1916, 230, 233.—MAYNARD, Cat. of Birds of the W. I., Dec. 1903, 19.

[*Quiscalus*] *luminosus* CORY, List of Birds of the W. I. 1885, 14, rev. ed 1886, 14.

Holoquiscalus luminosus RIDGWAY, Proc. Wash. Acad. Sci., 3, Apr. 15, 1901, 151; Birds No. & Mid. Am., 2, 1902, 225, 232.—CLARK, Proc. Bost. Soc. N. H., 32 (7), 1905, 284 —SHARPE, H.-L., 5, 1909, 510.

Quiscalus inflexirostris (not of Swainson) CORY, Cat. W. I. Birds, 1892, 111, 146, part (Grenada, Grenadines).

Description.—Adult male: Similar to *H. l. insularis*, but bill much longer and more slender. Wing, 117–125.5 (121.9) mm.; tail, 109–115 (113) mm.; culmen, 34–36 (35) mm.

Adult female: Similar to the female of *H. l. insularis*, but a trifle paler both above and below; bill much longer and more slender. Wing, 99.5–105.5 (102) mm.; tail, 86.5–91 (88.3) mm.; culmen, 28–31.5 (30.25) mm. Bill, legs and feet black.

Type locality.—Grenada, W. I.

Range.—Grenada and the Grenadines (Carriacou, Union, Bequia, Petit Martinique, Mustique, Tobago Keys).

Material.—Fifty-three specimens, 35 males and 18 females, all in the collection of the Museum of Comparative Zoology.

Remarks.—The best character for the identification of this form is the long, much decurved and relatively slender bill.

Young females are much paler below than adult females, the throat practically white; young males resemble the females except for patches of sooty black feathers, particularly on the back and scapulars.

***Holoquiscalus lugubris inflexirostris* (SWAINSON)**

Quiscalus inflexirostris SWAINSON, Anim. in Menag, 1838, 300, fig. 52.—CASSIN, Proc. Acad. Nat. Sci. Phila., 13, 1866, 407.—SCLATER, Proc. Zool. Soc. Lond., 1874, 175, part (St. Lucia); Ibis, 1884, 160, part (St. Lucia); Cat. Birds Br. Mus., 11, 1886, 401, part (St. Lucia); CORY, Auk, 3, 1886, 224, part (St. Lucia); Birds W. I., 1889, 111 part (St. Lucia); Cat. W. I. Birds, 1892, 15, 111, 146, part (St. Lucia).—RIDGWAY, Proc. U. S. Nat. Mus., 12, 1890, 130.—MAYNARD, Cat. Birds W. I., Dec. 1, 1903, 19, part (St. Lucia).

[*Quiscalus*] *inflexirostris* BONAPARTE, Consp. Av. 1, 1850, 424.

[*Quiscalus*] *inflexirostris* GRAY, H.-L., 2, 1870, 38, no. 6525.—SCLATER AND SALVIN, Nom. Av. Neotr., 1873, 38, part (St. Lucia).—CORY, List Birds W. I., 1885, 14 (rev. ed., 1886, 14) part (St. Lucia).

Holoquiscalus inflexirostris RIDGWAY, Proc. Wash. Acad. Sci., 3, Apr. 15, 1901, 151; Birds No. & Mid. Am., 2, 1902, 225, 226, 230.—NICOLL, Ibis, 8th ser., 4, 561, 1904.—SHARPE, H.-L., 5, 1909, 510.—CLARK, W. I. Bulletin, 11 (3), 1911, 183.

Quiscalus lugubris (not of Swainson) SCLATER, Proc. Zool. Soc. Lond., 1871, 271; Semper, 1872, 650.

Quiscalus lutosus (not of Lawrence) ALLEN, Bull. N. O. C., 5, 1880, 166.

Adult male: Similar to *H. l. lutosus* but with the bill shorter and stouter. Wing, 120–127.5 (122.12) mm.; tail, 104–118 (110.62) mm.; culmen, 31–31.5 (31.12) mm.

Adult female: Similar to the adult male of the preceding but larger with shorter and stouter bill. Wing, 111.5 mm.; tail, 101 mm.; culmen, 27.5 mm. Bill, legs and feet black.

Type locality.—Described by Swainson in 1838 as “Inhabits —?” Attributed in 1873 by Sclater and Salvin¹ to St. Lucia and Martinique. There can be little doubt that the bird described and bill figured by Swainson is the one in question.

Range.—Island of St. Lucia, West Indies.

Material.—Five specimens, 4 males and a female.

***Holoquiscalus lugubris guadeloupensis* (LAWRENCE)**

Quiscalus guadeloupensis LAWRENCE, Proc. U. S. Nat. Mus., 1, Apr. 22 1879 457.—SCLATER Ibis, 1884, 160; Cat. Birds Br. Mus., 11, 1886, 401.—CORY, Ibis, 5th ser., 4, 1886, 474 (Marie Galante?); Auk, 3, 1886, 226, 8, 1891, 49; Birds W. I., 1889, 113; Cat. W. I. Birds, 1892, 15, 111, 147.—MAYNARD, Cat. W. I. Birds, Dec. 1, 1903, 19.

[*Quiscalus*] *guadeloupensis* CORY, List W. I. Birds, 1885, 14 (rev. ed., 1886, 14) (Guadeloupe).

Holoquiscalus guadeloupensis RIDGWAY, Proc. Wash. Acad. Sci., 3, Apr.

¹ Nom. Av. Neotr. 1873, 38.

15, 1901, 151; Birds No. & Mid. Am., 2, 1902, 225, 226, 232.—SHARPE, H.-L., 5, 1909, 510.—NOBLE, Bull. M. C. Z., 60 (10), Aug., 1916, 383, 384.

Holoquiscalus martinicensis RIDGWAY, Proc. Wash. Acad. Sci., 3, Apr. 15, 1901, 151; Birds No. & Mid. Am., 2, 1902, 225, 226, 231.—MAYNARD, App. to Cat. Birds W. I., Dec. 1, 1903, 37.—SHARPE, H.-L., 5, 1909, 510.—NOBLE, Bull. M. C. Z., 60 (10), Aug. 1916, 383 (crit.).

Quiscalus inflexirostris (not of Swainson) LAWRENCE Proc. U. S. Nat. Mus., 1, 1879, 355, 487.—SCLATER, Proc. Zool. Soc. Lond., 1874, 175 part (Martinique); Ibis, 1884, 160 part (Martinique); Cat. Birds Br. Mus., 11, 1886, 401, part (Martinique).—CORY, Auk, 3, 1886, 224, part (Martinique); 4, 1887, 96 (Martinique) Separates published Feb. 3, 1887; Birds W. I., 1889, 111, part (Martinique); Cat. W. I. Birds, 1892, 15, 111, 146, part (Martinique) MAYNARD, Cat. Birds W. I., Dec. 1, 1903, part (Martinique).

?[*Quiscalus*] *inflexirostris* SCLATER & SALVIN, Nom. Av. Neotr., 1873, 38, part (Martinique).—CORY, List Birds W. I., 1885, 14 (rev. ed., 1886, 14) part (Martinique).

*Quiscalus mexicanus*² CASSIN, Proc. Acad. Sci. Phila., 13, Dec., 1866, 403.

Description.—Adult male: Similar to *H. l. inflexirostris* but smaller and with a much shorter and stouter bill. Wing, 118.5–125 (120.95) mm.; tail, 101.5–106 (103.5) mm.; culmen from base, 29–31 (29.5) mm.

Adult female: Similar to *H. l. inflexirostris* but smaller and paler, with a shorter and stouter bill. Wing, 102–107.5 (105.3) mm.; tail, 78–92 (84.8) mm.; culmen, from base, 24–27 (25.6) mm.

Type locality.—Island of Guadeloupe, West Indies.

Range.—Guadeloupe, Martinique, Marie Galante?

Material.—Twenty-one specimens, 13 males (8 ad. 5 juv.), 8 females (some not quite adult).

Remarks.—Noble² places *Holoquiscalus martinicensis* in the synonymy of this species believing the difference between the two forms to be insufficient to warrant a distinction. In this conclusion I fully concur.

Young birds in the first plumage appear rather darker above and paler below than birds in the corresponding plumage of *luminosus*; this is particularly noticeable on the throat which in *guadeloupensis* is almost pure white.

***Holoquiscalus fortirostris fortirostris* (LAWRENCE)**

Quiscalus fortirostris LAWRENCE, Proc. Acad. Nat. Sci. Phila., 1868, 360 428.—SCLATER, Proc. Zool. Soc. Lond., 1874, 175; Ibis, 1878, 334; 1884

¹ cf. Ridgway, Birds No. & Mid. Am. 2, 1902, 231 foot note.

² Noble, Resident Birds of Guadeloupe, Bull. M. C. Z. 60 (10) 1916, 483.

161; Cat. Birds Br. Mus., 11, 1886, 400.—CORY Ibis, 5th ser., 4, 1886, 472; Auk, 3, 1886, 223; Birds W. I., 1889, 111; Cat. W. I. Birds, 1892, 15, 111, 134, 146.—FEILDEN, Ibis, 6th Ser., 1, 1889, 480, 485.—MAYNARD, Cat. Birds W. I., Dec. 1, 1903, 19.—ANON. W. I. Bull. 4, 1903, 140.—BALLOU, W. I. Bull. 12, 1912, 220.

[*Quiscalus*] *fortirostris* GRAY, H.-L., 2, 1870, 38, no. 6532.—SCLATER AND SALVIN, Nom. Av. Neotr., 1873, 38.—CORY, List Birds W. I., 1885, 14 (rev. ed., 1886, 14).

Holoquiscalus fortirostris RIDGWAY, Proc. Wash. Acad. Sci., 3, Apr. 15, 1901, 151; Birds No. & Mid. Am., 2, 1902, 225, 230; NICHOL, Ibis, 8th ser., 4, 1904, 557.—CLARK, Proc. B. S. N. H. 32 (7), Oct., 1905, 220, 227, 282.—SHARPE, H.-L., 5, 1909, 510.

Description.—Adult male: Similar in general style and pattern of coloration to the males of the *H. lugubris* group but much smaller with a short, stout almost straight bill. Wing, 102–110 (105.8) mm.; tail, 91–107 (99.4) mm.; culmen from base, 26–28 (26.75) mm.

Adult female: Similar to the male but smaller in all measurements, metallic gloss duller and washed with deep sooty brown. Wing, 90.5–94.5 (93.1) mm.; tail, 86–91 (88.5) mm.; culmen, from base, 23–26 (24.25) mm. Bill, legs and feet black; iris “straw-yellow in adult, white in young,” Feilden.

Type locality.—Island of Barbadoes, W. I.

Range.—Island of Barbadoes, West Indies.

Material.—Ten specimens, 6 adult males, 4 adult females, all in the collection of the Museum of Comparative Zoology.

Holoquiscalus fortirostris dispar (CLARK)

Holoquiscalus dispar CLARK, Proc. Biol. Soc. Wash., 18, Feb. 21, 1905, 61; Proc. Bost. Soc. N. H., 32 (7), 1905, 284.

Holoquiscalus inflexirostris (not of Swainson) RIDGWAY, Birds No. & Mid. Am., 2, 1902, 230, part (St. Vincent).—SHARPE, H.-L., 5, 1909, 510, part (St. Vincent).

Quiscalus inflexirostris (not of Swainson) CORY, Cat. W. I. Birds, 1892, 111, 146, part (St. Vincent); Birds W. I., 189, 111 part (St. Vincent).

Quiscalus ? LAWRENCE, Proc. U. S. Nat. Mus., 1, 1878, 191 (St. Vincent).

Description.—Adult male: Similar to adult male of *H. l. inflexirostris* but slightly smaller; tail longer. Wing, 119.5 mm.; tail, 121.5 mm.; culmen from base, 30.5 mm.

Adult female: Similar to adult female of *H. l. fortirostris* but blacker (less sooty above), browner (more sooty) below. Wing, 93–93.5 (93.25) mm.; tail, 89 mm.; culmen from base, 25 mm.

Type locality.—Kingstown, Island of St. Vincent, West Indies.

Range.—St. Vincent.

Material.—Three specimens, 1 adult male, 2 adult females (including the type). All in the collection of the Museum of Comparative Zoology.

Remarks. — The status of this form appears to be somewhat uncertain. The material now before me is too meagre to form a basis for any definite conclusion but it seems to me not wholly improbable that two forms of *Holoquiscalus* occur on St. Vincent. The only male specimen is a fine highly colored adult, scarcely distinguishable from *H. l. inflexirostris*. He is larger than Barbadoes birds with a longer and relatively more slender and more curved bill. The females on the other hand are almost identical with females from Barbadoes, but bear not the slightest resemblance to any female specimen of the *lugubris* type.

***Holoquiscalus rectirostris* (CASSIN)**

Quiscalus rectirostris CASSIN, Proc. Acad. Nat. Sci. Phila., 1866, 409.—SCLATER, Cat. Birds Br. Mus., 11, 1886, 400 (in syn. of *Quiscalus fortirostris* witha?).—STONE, Proc. Acad. Nat. Sci. Phila., 1899, 35 (Syn. with *Quiscalus fortirostris*?).

[*Quiscalus*] *rectirostris* GRAY, H.-L., 2, 1870, 38, no. 6531.

Holoquiscalus rectirostris RIDGWAY, Proc. Wash. Acad. Sci., 3, Apr. 15, 1901, 151; Birds No. & Mid. Am., 2, 1902, 225, 233.—SHARPE, H.-L., 5, 1909, 510.

Adult male? "——— Black, entire plumage with a dark purple lustre
Original diagnosis.

very slightly changing to greenish on the wings and tail; bill and feet black
."

Adult female: Unknown.

Type locality.—Unknown.

Range.—Unknown.

Material.—No specimens seen by me.

Remarks.—This species is known only from the type specimen in the Academy of Natural Sciences of Philadelphia and is said to be "quite distinct."²

GENERAL NOTES

American Common Tern Recovered in West Africa.—A most striking example of the great value of systematic bird banding to ornithological science, has been recently received at the office of the Biological Survey, U. S. Dept. of Agriculture.

² cf. Ridgway, Birds No. & Mid. Am. 2, 1902, 233 foot note.

On July 3, 1913, Dr. John C. Phillips, of Wenham, Mass., banded one hundred juvenal Common Terns, *Sterna hirundo*, at Eastern Egg Rock, Muscongus Bay, Me., using American Bird Banding Association bands, numbered from 1201 to 1300, inclusive. Four years later, in August, 1917, a native of the village of Ikibiri, on the Nun branch of the Niger River delta, South Nigeria, West Africa, found one of these birds, number 1258, floating in the river, dead. He removed the band and carried it to the Rev. Oswald N. Garrard, of the Church Missionary Society at Patami, from whom the information was received. The native informed the Rev. Garrard that it was a matter of frequent occurrence at that time of the year to find these birds dead, in the river, although no evidence such as might account for this statement was forthcoming.

The almost cosmopolitan range of *Sterna hirundo* is, of course, a matter of common knowledge, but it has no doubt been generally assumed that it was the European breeding birds that wintered in Africa, while the North American colonies would, for the same reason, be presumably in South America at that season. This assumption is probably more or less correct although definite data of the character provided by number 1258 has been lacking. However, the case in question proves that occasionally, at least, North American birds of this species do make the trans-oceanic flight to Africa.

The date is also of peculiar significance, indicating that because of poor condition or other reason, the bird was a non-breeder or that it had bred early either in Europe or America (?) and had immediately moved back to its winter quarters. There is, of course, no information as to how long the bird had been dead when found, but it is extremely improbable that it had been so for more than a very few days or it would have been discovered and eaten by some carnivorous animal.—FREDERICK C. LINCOLN, *Biological Survey, Washington, D. C.*

Swans on the Hudson River.—Four swans, apparently *Olor columbianus* (Ord) were observed February 19, from the window of a south-bound New York Central train. They were swimming in the open water at the end of a culvert which connects the Hudson river with a rather extensive bit of marsh about two miles north of Staatsburg, N. Y. The swans were on the marsh side of the culvert and seemed not to be disturbed by the train which passed within a few yards of them. A few crows were walking about on the ice near the swans and out in the river many ducks were seen.—S. C. BISHOP, *State Museum, Albany, N. Y.*

King Eider (*Somateria spectabilis*) in Michigan Waters.—Three King Eiders spent the greater part of the winter in the St. Clair River and contiguous waters greatly to the delight and wonder of observing bird lovers. These handsome birds came down from the arctic about the middle of November and remained throughout December and the month of January. They were under observation much of the time and while

wary and suspicious at first, they eventually became quite tame as they made friends with some domesticated Mallards belonging to Mr. Robert Chambers, keeper of the Canadian Gun Club near the junction of the St. Clair and the Basset. King Eiders were also reported at the bird reserve of Mr. Jack Miner, near Kingsville, Ont., a few miles south of the St. Clair.

Records of the visits of the King Eider in Michigan waters are few and have been usually confined to severe winters; but, as the past winter was of unusually mild temperature, the cause of this welcome visit remains problematical.

Another arctic visitor the past winter was the Snowy Owl (*Nyctea nyctea*), hundreds of which visited southeastern Michigan, many of them being taken for mounting and for the Zoo at Belle Isle, Detroit's beautiful park.—ETTA S. WILSON, *Detroit, Mich.*

An Earlier Consideration of *Botaurus lentiginosus*.—With reference to Dr. Oberholser's remarks about this species (*Auk*, Jan., 1921, p. 80), as agreement is always a good thing, it may be mentioned that in 1915 in a list of additions and corrections to our 'Hand-list of British Birds,' it was decided to treat this bird as a distinct species (see 'British Birds,' Vol. IX, p. 6).—H. F. WITHERBY, *London, Eng.*

Louisiana Clapper Rail in Mississippi.—Among some skins that Dr. Oberholser very kindly identified for me recently, was a specimen of the Louisiana Clapper Rail (*Rallus longirostris saturatus*). The bird, a female, was shot by me in a salt marsh at Gulfport, Harrison County, Miss., on January 18, 1919, and is in my collection.

Speaking of the range of this species, Dr. Oberholser says, "Although the form *Rallus longirostris saturatus* has been recorded as far east as Alabama, there seems to be no published record for Mississippi."—STEPHEN S. GREGORY, JR., 456 Surf St., *Chicago, Ill.*

The Type Locality of *Ortalis v. vetula*—a Correction.—In 'The Auk' for January, 1921, in a revision of *Ortalis vetula*, we designated the type locality of typical *vetula* as Tampico, Tamaulipas (p. 46). We have since received a letter from Dr. Carl E. Hellmayr, who writes that Wagler's type is in the Munich Museum. He also kindly informs us that the collector, a Mr. Keerl, did not visit the State of Tamaulipas, according to the records of the Museum, but worked in the vicinity of Vera Cruz, and then went up to the City of Mexico. It is, therefore, nearly certain, as Dr. Hellmayr points out, that the type was obtained in the neighborhood of Vera Cruz, and the type locality of *Ortalis v. vetula* should be corrected to "neighborhood of the city of Vera Cruz, Mexico."—W. DEW. MILLER AND LUDLOW GRISCOM, *American Museum of Natural History, New York.*

Passenger Pigeon in Wisconsin.—What I believe to be an authentic record of the occurrence of the Passenger Pigeon in Wisconsin in 1905 is given me by Mr. O. L. Wetterhall. In the fall of that year, Mr. Wetterhall, who is an old hunter and who took hundreds of Wild Pigeons in the '70s, was a guest of a farmer near Oconomowoc, and he and his son went out to a large stubble field, where flocks of Mourning Doves were feeding on the loose grain which had been left on the ground.

It was a windy day and the doves were hard to shoot, but about forty were taken, and among them an adult male Passenger Pigeon. Mr. Wetterhall showed this bird to a number of people, who remarked on its being very rare, but did not realize that it was practically extinct. It was picked and cooked with the doves.

Though formerly abundant in the woods along the Des Plaines River, west of Highland Park, Illinois, the last record I know of was a female which I saw at close range in 1894. This bird was in a small oak tree within fifteen feet of the walk on which I was passing, and was so busy preening its feathers, that I stood unnoticed for several minutes watching it, until a passing wagon frightened it away.—HENRY K. COALE, *Highland Park, Illinois*.

West Africa the True Habitat of *Glaucidium tephronotum*.—On page 78 of Brabourne and Chubb's 'Birds of South America' (1912) we find listed as No. 723: *Glaucidium tephronotum* Sharpe, Sharpe's Pygmy Owl, "Patr. ign." The species is included in this work because, as we read in the original description,¹ the bird was "said to be from 'South America.' It was presented to the British Museum by Mr. W. Wilson Saunders, F. R. S." A colored figure of this Pygmy Owl appears in the 'Catalogue of the Birds in the British Museum,' II, 1875, Pl. XIII, fig. 2; but up to the present time no further specimens have ever been reported from any part of the New World.

Now among the many remarkable birds discovered by Mr. G. L. Bates in the Southern Cameroon, West Africa, there is one whose validity has not hitherto been questioned, but which certainly merits careful comparison with *Glaucidium tephronotum*. This is *Glaucidium pycrafti*, described by Mr. Bates in 'The Ibis,' 1911, p. 85, and figured in color on Plate VII of the same volume. In studying the four specimens of *Glaucidium pycrafti* collected by Mr. Herbert Lang and myself in the northern Ituri Forest of the Belgian Congo, in 1910, 1913, and 1914, I chanced to compare the two plates above mentioned, and was struck by their very pronounced resemblance. Although the general tone of the crown and back would seem to be decidedly bluer in *tephronotum*, yet I find that our Congo specimens are more nearly like the figure of *tephronotum*, and not one is as brown as that of *pycrafti*.

Even between the descriptions of the two species, the principal diver-

¹ Ibis, 1875, p. 260.

ences are that *tephronotum* is said to have the upper wing-coverts "rather blacker than the back," while in *pycrafti* they are browner, and that the under wing-coverts, said to be "vinous-chestnut, streaked with brown," in *tephronotum*, "the innermost ones and the axillaries yellowish," are largely whitish, streaked with dusky brown, in *pycrafti*.

If, however, we go back to the original description of *Glaucidium tephronotum* in Latin, we find that these differences are not so real after all: "subalaribus flavicanti-albidis, exterioribus vinascentibus et minute brunneo notatis: tectricibus alarum superioribus alisque dorso concoloribus, tectricibus majoribus primariisque paullo brunnescentibus."

Even in dimensions there is practically no difference between the two type specimens(the wing of *tephronotum* was given as 4.05 inches (= 102.8 mm.), that of *pycrafti*, 105 mm. (Bates); tail of *tephronotum*, 3 inches (= 76.2 mm.), of *pycrafti* 70 mm. (Bates). Our specimens from the Ituri region are slightly larger: wing ♂, 111, 115; ♀, 113, 120; tail ♂, 84, 82; ♀, 82, 87.

There can scarcely be any doubt, I feel, of the identity of the two species in question, *Glaucidium tephronotum* having been erroneously attributed to the South American fauna. This is an exact parallel to the case of *Accipiter castanilius*, described by Bonaparte² from a specimen in the Verreaux collection, presumably from South America. Dr. Sharpe believed it to be indigenous to New Granada, and even referred it in the 'Catalogue of Birds in the British Museum' to the Neotropical genus *Micrastur*, notwithstanding the fact that it had since been redescribed from West Africa as *Astur macrocelides*, by Hartlaub.³ To such an oversight, in these days of specialization any of us is liable.

The range of *Glaucidium tephronotum* may now be stated, in view of the specimens from the Upper Congo: Forests of Lower Guinea from the River Ja, Southern Cameroon, eastward to the Nepoko River, in the Ituri District. Since the type locality 'South America' is erroneous, I designate as the type locality, if, indeed, it does not become so automatically: Bitye, S. Cameroon, where Bates rediscovered the species.—JAMES P. CHAPIN, *American Museum of Natural History, New York*.

A Kingbird's Unusual Nesting Site.—While visiting Seaside Park, N. J., during the early part of July, 1919, I found a Kingbird (*Tyrannus tyrannus*) nesting on the top of a street electric light reflector, the light being in use every night. The nest contained three young birds and was placed between and attached to the two insulated wires which supplied current to the light, the bottom of it resting on the top of the reflector.

As far as could be ascertained without disturbing the young, the nest externally was constructed mainly of string and broken pieces of fishing line which were attached to the wires and formed a kind of basket in which

² Rev. et Mag. Zool. 1853, v. 598.

³ Journ. für Orn., 1855, p. 354.

the lining had been placed. It is interesting to note that no other light in the immediate vicinity presented just the same conditions that made the building of this nest possible.

With the exception of some small Norway Poplars and low bushes there are no trees in this section of the country which probably accounts for the choice of such an unusual nesting site.—A. C. GARDNER, *Wilmington, Del.*

Arkansas Kingbird in Virginia.—On September 19, 1919, while in company with Dr. B. H. Warren at Wallop's Island, Virginia, we noticed a pair of Arkansas Kingbirds (*Tyrannus verticalis*) associating with a small flock of the common Kingbirds, and Dr. Warren secured one of them. Their actions, while similar to those of the common species, were sufficiently different to attract our attention. So far as I am aware this is the first record for the State.—THOMAS H. JACKSON, *West Chester, Pa.*

Note on the Name *Gazzola Bonaparte*.—Walden (Trans. Zool. Soc. Lond., 8, 1872, p74) has clearly shown that *Gazzola Bonaparte* is a synonym or *Graucalus* authors. Unfortunately Walden did not rename Bonaparte's genus and no subsequent author appears to have proposed a substitute, therefore I propose, *Nesocorax* with *Gazzola typica Bonaparte* as the type. The two species will then stand as: *Nesocorax typica* (Bonaparte) and *Nesocorax unicolor* (Rothschild and Hartert).—J. H. RILEY, *Washington, D. C.*

Magpies and Live Stock.—The writer was interested in the note in the April number of 'The Auk' (XXXVIII, 1921, p 276) concerning attacks on sheep by Magpies. Some notes on this subject in the writer's possession may be of interest also.

Mr. A. H. Schatz, a former resident in the Black Hills, of South Dakota, related to me some years ago the following facts. John White, a farmer living in the foot hills of the Black Hills, had a cow which was old and weak. In the severe winter of 1914-15 Magpies alighted upon her back and pecked at the rectum until it was deeply gouged out, and it became necessary to shoot the animal. This was the only instance of the kind to occur that winter in that locality, so far as Mr. Schatz knew. In the winter of 1915-16 the Magpies continued this habit on other animals, and it became so widespread that there was general talk of organizing a crusade against these birds. Mr. Schatz was explicit in his statement that most of these attacks were made upon healthy animals.

I have no later reports concerning the habit in these birds of the Black Hills region, but I have on file a newspaper clipping dated from Ainsworth, Nebraska, December 23, 1919, from which the following extracts are taken: "Over on Plum Creek near the Charlie Edwards place, a large number of cattle and horses have been kept every winter because the country is quite well sheltered with trees, and the surface is hilly, thus

affording shelter from the north winds, and as a rule the snow has not been so deep as to entirely cover the grass. This year, however, it has all been covered and there has been little picking for any kind of animals or birds.

"And now the story comes from the section that the Magpies, which are unusually thick this year, are alighting on the backs of the horses and cattle and simply picking away the flesh until a good sized hole has been made, when they tackle the animal in earnest and make a fill of his flesh. The story is that Alva Stine has lost two or three horses, and that George Sindlinger has lost a valuable bull from the Magpie attacks."

Each of the accounts here given contains the evidence that this habit of Magpies to attack healthy cattle (free from sores or wounds) was a novelty in the respective localities.—T. C. STEPHENS, *Sioux City, Iowa*.

Notes of the Starling.—The U. S. Department of Agriculture bulletin (No. 868) on the Starling, commented upon in the April 'Auk' alludes to the ability of this bird as a mimic and lists ten native species, the notes of which it has been heard to imitate. The writer, located close to the center of Starling population, can add the names of the following ten native species which he has heard the Starling creditably and in several instances very exactly imitate: Tufted Titmouse, Red Cross-bill, Kingfisher, Crow, Baltimore Oriole, House Wren, Red-shouldered Hawk, Red Headed Woodpecker, Chickadee, White-breasted Nuthatch, and in addition the harsh notes of the Guinea Fowl. On one occasion a single Starling, in a short time was heard to imitate the calls of six different species. The ability to mimic does not appear to be shared equally by all individuals, at least is not equally exercised, and good mimics are rarely met here. During the twenty-one years that this bird has been a local resident I have heard it imitate the calls of other birds on less than fifty occasions, the majority of these falling within the past five years. I do not include the so-called "Wood Peewee" note of the Starling as mimicry. It is so frequently uttered as to suggest that the similarity is a coincidence, though proof of this is only possible by comparison with the notes of the bird in Europe.

The abilities of this bird emphasize the necessity of using the eye as a supplement to the ear in making identifications in the Starling belt.—CHARLES A. UFFNER, *Elizabeth, N. J.*

A Question Concerning the Cowbird.—Does the female Cowbird take any interest in the fate of the eggs she lays in the nests of other birds?

This question has often occurred to me since an incident I observed in 1915. On June 29 of that year, at Albion, Iowa, I discovered a two-story Red-eyed Vireo nest (*Vireosylva olivacea*). The nest had originally contained one Cowbird egg, but the Vireo had at this time added to the

height of the nest walls and laid a new bottom above this egg. Subsequent to this three Cowbird eggs had been laid and the Vireo was incubating them at the time the nest was discovered.

On the 30th I returned with a camera to photograph this nest, which was in a low oak scrub, and discovered a female Cowbird near the nest. My first idea was, of course, that she was there to lay in the nest. Her subsequent actions were unusual if this was the explanation of her presence. I have several times observed Cowbirds approaching a nest or leaving it after depositing an egg and have always been impressed with the furtive, sneaking actions on such occasions. This bird remained in the tree and was visibly disturbed by our presence. She scolded a little and acted very much like an anxious female alarmed at an intrusion at her nest. On July 1 she was again present when we passed the nest but on my return again to this locality on July 13 I found the eggs broken and the nest deserted. I have often wondered since at the actions of this bird and decided to publish this note in the hope of learning whether any other person has had a similar experience.—IRA N. GABRIELSON, *Portland, Oregon*.

The Nonpareil Wintering in Florida.—On October 28, 1920, I observed two male and three female Nonpareils on the banks of the Miami Canal at the juncture of the Ta-Miami Canal (just outside the city of Miami). On December 13, 1920, I observed two females at the same spot. In the intervening six weeks I made a canoe trip to Fort Myers, Florida, through the Everglades and did not see another Nonpareil.

Ruby-throated Hummingbirds are common around Miami in the winter.—EDGAR BEDELL, *Waterford, N. Y.*

✓ **The Black-backed Kamchatkan Wagtail, *Motacilla lugens* Kittlitz, in Alaska.**—During the course of the expedition to the Arctic coasts of East Siberia and Northern Alaska in 1913 and 1914, upon which Messrs. Joseph Dixon and W. Sprague Brooks went as zoological collectors, their power schooner, the "Polar Bear", put into the harbor at Attic Island, the outermost of the Aleutian chain, in early May, 1913. From the deck of the vessel here several black and white Wagtails, recognized as *Motacilla lugens* Kittlitz, were seen flitting about the beaches, and on May 4, one adult male was secured.

This specimen, now No. 21590 collection of John E. Thayer, is the first, we believe to be recorded from North America. It was not listed by Brooks in his account of the birds taken on the trip. (Bull. Mus. Comp. Zool., 1915, LIX, No. 5.)

Hartert in 'Die Vögel der paläarktischen Fauna,' treats *Motacilla lugens* as a subspecies of *M. alba*, but the Kamchatkan bird differs so strikingly from its next door neighbor, *M. ocularis* Swinh, that we prefer to give it specific rank.—JOHN E. THAYER AND OUTRAM BANGS, *Cambridge, Mass.*

The Mockingbird of St. Thomas, West Indies.—Mr. Ridgway recorded *Mimus gilvus* from St. Thomas in the 'Proceedings of the U. S. Nat. Museum,' Vol. 7, 1884, p. 172. This record was based on one specimen, part of a small collection of birds made by Messrs. Benedict and Nye from January 17–24, 1884, during a trip of the U. S. Fish Commission Steamer "Albatross." In 1889 Mr. Charles B. Cory in his 'Birds of the West Indies,' (p. 35) says of *Mimus gilvus*: "Common in St. Vincent, Grenada, Santa Lucia, and St. Thomas." Subsequently Martinique and Nevis were added to its range in the Lesser Antilles. The commonness of the species on the islands of the Lesser Antilles mentioned above seems well attested by the synonymy given by Mr. Ridgway in his 'Birds of North and Middle America,' Part IV, p. 235, but I am unable to find any but the reference given above for the capture of a specimen on St. Thomas, so that the statement that it is common on that island would certainly seem to require confirmation.

In August and September, 1916, Mr. Rollo H. Beck collected on St. Thomas for Mr. Frederick F. Brewster and Dr. L. C. Sanford. The land birds obtained have been generously presented to the American Museum, and in identifying and distributing them I came across a series of Mockingbirds, including 3 young of the year, which are most certainly *Mimus polyglottos orpheus* (L.). St. Thomas is part of the Greater Antilles as far as its avifauna is concerned, so that a race of *polyglottos* is the logical Mockingbird to occur on the island.

The probability of *M. gilvus* occurring there also is in my opinion remote. Mr. Ridgway has called attention to the fact that it is not certain whether the Lesser Antillean *gilvus* is the typical Guiana form or not, but if it is it would be reasonable to suppose that it was introduced, as a distinct form occupies an intermediate island. Even if it should prove to be a distinct form, its occurrence on St. Thomas would not be rendered more probable. So I wrote to Dr. Charles W. Richmond of the National Museum for such information about the specimen of *M. gilvus* from there as he might be able to give me. He has kindly replied in detail. The specimen is correctly identified, but "does not bear an original label, and the data is written in a hand that I recognize as one of Mr. Ridgway's early assistants, so there is a possibility that the bird came over here without a label, or with a lot that came chiefly from St. Thomas, but I cannot find anything to support this suspicion further. If you have to deal with this record in print, I think it would be well to question it as uncertain."—LUDLOW GRISCOM, *American Museum of Natural History, New York City.*

Coereba bahamensis at Miami, Fla.—At the bathing beach, Miami, Florida, February 7, 1921, I was trying to locate the author of an unfamiliar warbler-like chipping note in a cocoanut tree when a *Coereba bahamensis* came into full view for a moment at the base of the palm fronds, before it flew.

My first impression was utter astonishment at encountering in the eastern United States a bird the appearance of which was so unfamiliar to me. A yellow breast, differentiated from white throat and belly, bold white eye-stripe contrasted with black, rather large slightly curved bill, and other characters having been noted, I was able to immediately identify my bird with certainty in a text-book courteously loaned me by the director of the Miami Aquarium. Its identity was further verified a few days later at Nassau, Bahamas, where I found the same species common enough.

At Nassau, one of these birds was observed taking a morning bath, fluttering in the dew on the broad leaves of a low plant. This is likely a common habit, but was none the less interesting to observe for the first time.—J. T. NICHOLS, *New York City*.

The Sycamore Warbler (*Dendroica dominica albilora*) on the Coast of South Carolina.—I wish to place on record the capture by myself of a young female in full autumnal plumage of this form on the morning of July 13, 1916, near Mount Pleasant. Long before I left home for a swamp (where I collect), a storm was prevailing which increased to hurricane violence before sunset. This bird was carefully examined after being shot and there was the faintest trace of yellow in the supercilary stripe. I, however, waited until I could collect another female of corresponding age to establish the identity to a certainty and found that I had taken the western form of *dominica*. Of the very large series of *D. dominica dominica* that Mr. Brewster collected near Charleston in 1883, '84 and '85, not a single individual showed any tendency towards *albilora*, if my memory serves me correctly, he and I having remarked upon it when the birds were collected.

Mr. Leverett Mills Loomis found the Sycamore Warbler to be a regular fall migrant at Chester, S. C., and noted it as breeding in Pickens County, S. C.

The migration of this subspecies is truly remarkable for the specimen taken by me on July 13, 1916, is the first one I have ever seen since I began to collect birds in 1883.—ARTHUR T. WAYNE, *Mount Pleasant, South Carolina*.

The Orange-crowned Warbler in Indiana.—On the eighth of May, 1921, I took a female Orange-crowned Warbler, *Vermivora celata*, at Dune Park, Porter County, Indiana. This little bird was industriously exploring the terminal clumps of a thicket of low willows in true Kinglet fashion and I came near passing it by as such until attracted by its very yellowish appearance. Captures of the Orange-crowned Warbler in the east Central States are infrequent and I wonder if this fact is not due in part to the bird being overlooked and not entirely to its extreme rarity.—CHRISWELL J. HUNT, *Chicago, Illinois*.

The Hooded Warbler in Delaware.—On May 3, 1921, while out making observations on the spring migrations of our warblers I was pleased to record the appearance of a male Hooded Warbler (*Wilsonia citrina*). This was in the morning. In the afternoon I observed two males of this species. The birds were not at all shy and permitted observation at close quarters so there could be no mistake as to identification.

So far as I know this species has never been recorded in any lists of the birds of this State. We may, therefore, add this warbler to the avifauna of Delaware as a transient migrant.—A. C. GARDNER, *Wilmington, Del.*

The Tufted Titmouse (*Basolophus bicolor*) in Erie County, N. Y.—This species has always been regarded as a rare straggler in the western counties of New York, and I am consequently pleased to be able to record definitely its capture near Hamburg on April 3, 1921. Mr. James Savage, of Buffalo, and myself were entering a rather extensive hardwood swamp just south of Hamburg, when we heard the peculiar "peto, peto, peto, peto" call. The bird was soon located near the top of a rather large tree, and was readily identified as a Tufted Titmouse by its plain colors and crest.

It kept well to the tops of the taller trees, and moved gradually eastward through the woods. Its monotonous notes, with occasional pleasing variations, were heard almost constantly. The specimen was taken by Savage, and proved to be a fine male. The bird will be mounted for the collection of the Buffalo Society of Natural Sciences.

Although both Mr. Savage and myself were familiar with the species neither of us had ever met with it in any of the western counties of New York. The locality of the capture lies in the old lake plain, about five miles from the southern shore of Lake Erie, the region being drained by the Eighteen Mile Creek and its tributaries.—THOMAS L. BOURNE, *Hamburg, N. Y.*

The Willow Thrush in the District of Columbia.—Early on the morning of September 2, 1920, just inside one of the entrance gates of the National Zoological Park at Washington, D. C., I picked up a thrush, still in *rigor mortis*. The bird was recognized as an unusual one for this region and so was taken to the National Museum, where it was identified as the Willow Thrush (*Hylocichla fuscescens salicicola*). The specimen, a male, is now number 256,940 of the National Museum collection. This is the first record for the subspecies in the District of Columbia.—N. HOL-LISTER, *Washington, D. C.*

Notes on Alabama Birds. *Larus argentatus*. HERRING GULL.—While in the Eastern part of Elmore County on Tallapoosa River, on April 21, I noticed a young woman, a daughter of a planter, with a large Herring Gull, apparently two or three years, judging from its plumage, in her arms. On making inquiry I learned that it was captured on April 16, at her home nearby, after a considerable wind storm of that day.

The bird's wing was not broken, but injured, and it made no effort to fly. It was quite vicious when handled, but was in no apparent pain, from the injuries to its wing. This Gull has been reported several times in the interior of the State, and a large female in full plumage, is in the collection of the Alabama State Department of Archives and History, which was shot at Lock 12, Chilton County.

***Elanoides forficatus*. SWALLOW-TAILED KITE.**—The Alabama State Department of Archives and History has just added to its collection, a handsome specimen of the Swallow-tailed Kite, in full plumage and coloring. It was shot January 26, 1921, at Hartford in Geneva County, in the southern part of this State. The bird was killed by mistake as a hawk, and forwarded to the Conservation Commissioner, who in turn presented it to the Department. It has been mounted, and is on display in the Museum. This is the only bird of this species reported in the State, in a number of years, and has proven a very interesting contribution.

***Astragalinus tritis tritis*. GOLDFINCH.**—For several years I have made records of the Goldfinch in the city of Montgomery. In 1918, the migration through the city took place from the 17th to the 24th of February, and 28 to 34 birds were noted on the grounds of the State Capitol daily. In 1919, they were noted during the last week in February. In 1920, they were noted on April 18, and remained in the city for several days. This year I had failed to note a single one, up to April 27, when two pairs were reported to me within two blocks of the Capitol, but I have made diligent inquiry and no one had observed any in this city up to this date.

The flight north has apparently been made earlier this year, on account of our extreme early Spring, or may be they did not stop in the city, though on 10 or 12 excursions to the country around the city of Montgomery, since the first of January, I have failed to note a single specimen.

***Planesticus migratorius migratorius*. ROBIN.**—The annual migration of Robins through the city of Montgomery, took place this year, during the latter part of February, and for ten days thousands were observed on the city streets. Since that time occasional individual have been noted. On Saturday afternoon, April 23, two pairs were called to my attention on South Lawrence Street, in the heart of the residence section, and during that week, the female spent thirty minutes in my back yard, on High Street. I noted three days before a pair in the grounds of the State Capitol.

These records for the Robins are the latest in my possession and a pair was reported to me as nesting in the city, though I have not seen the nest.
—PETER A. BRANNON, *Montgomery, Ala.*

Some Birds Observed at Pine Mountain Kentucky.—I spent the week of April 28 to May 4, 1921, on the western slope of Pine Mountain, Harlan Co., Ky., in the region made familiar by the writings of John Fox,

Jr. As ornithologists have rarely visited the mountains of eastern Kentucky there is but little on record regarding the bird life, practically the only paper being that of Mr. A. H. Howell ('Auk,' 1910, p. 295). Mr. Howell's observations were made on Black Mountain to the east, on the Virginia line, and at other points to the west of the ground I covered, Pine Mountain is a long ridge running parallel to Black Mountain and separated from it by a valley through which runs the Poor Fork of the Cumberland. It forms an absolute watershed with no break north of Cumberland Gap. The streams arising on its western slope flow north or south along a narrow valley at its base until they break through the lower mountains to the west. Pine Mountain rises to an elevation of 2750 feet, being 500 feet above the valley. Both valleys are Carolinian in their fauna, such birds as the Cardinal, Chat, Louisiana Water-Thrush, Worm-eating Warbler, Carolina Wren, Carolina Chickadee, Tufted Tit and Greatcatcher being common in the western one and many of the same with the addition of the Rough-winged Swallow and Summer Tanager about Dillon on the Poor Fork, although my observations at this point were but casual.

Birds not mentioned by Mr. Howell which I found near Pine Mountain Post Office on the western side of the mountain are: Great Horned Owl, Turkey Vulture, Pileated Woodpecker, Whip-poor-will, Blue Jay, Towhee, Scarlet Tanager and Cedar Waxwing, and among the migrants which were passing through at the time of my visit the White-throated Sparrow, Myrtle, and Chestnut-sided Warblers and Tree Swallow. Quite likely the last two were summer residents in the neighborhood. Other species which I took to be transient migrants were the Redstart, Blackburnian and Black-throated Green Warbler, all of which were found as summer residents on Black Mountain by Mr. Howell.

A few pairs of English Sparrows are established near Pine Mountain, P. O., and I found a single pair of Song Sparrows and a few Grackles (*Quiscalus q. aeneus*?) at the Settlement School though both species seem to be rare in the district. Phoebees were especially common among the wild mountain ridges where they seemed out of place, and also Hooded Warblers, Ovenbirds, and White eyed Vireos, and it was interesting to find the Osprey so far inland, along the Poor Fork of the Cumberland.

My friend Mr. Herman Behr, who was with me, and had visited the region earlier in the year, adds the following species not listed by Mr. Howell; Barred Owl, Red-tailed Hawk, Ruffed Grouse, Wild Turkey and Spotted Sandpiper.—WITMER STONE, *Academy of Natural Sciences, Philadelphia*.

Records of Interest from Meriden, Connecticut.—I submit below a few notes on the rarer species of birds for this vicinity; from records that I have carefully kept and assembled during the past twenty years.

***Colymbus auritus*.** HORNED GREBE.—Fall migrant, August 25, 1916 to November 18, (1913) on inland ponds. February 1, 1914, speci-

men taken alive by ice-cutters after it had flown into a channel of open water; apparently exhausted by long flight. Kept and fed in tub of water for three days it would not fly away, and was found dead on the fourth morning. It is now mounted in Peabody Museum collection, Yale College.

Podilymbus podiceps. PIED-BILLED GREBE.—Common fall migrant, breeding on local ponds in the summers of 1908 and 1920.

Erismatura jamaicensis. RUDDY DUCK.—August 10, 1919, female watched at close range and with eight-power glasses on Mt. Higby Reservoir. The bird was molting and the still water was flecked with bits of down as it preened itself. It was entirely indifferent to my presence not over eighty feet distant, November 7, 1920. Male on same lake would not take wing, and was possibly wounded.

Florida caerules. LITTLE BLUE HERON.—August 13, 1920, adult and one white immature, at Mt. Higby Reservoir.

Limosa haemastica. HUDSONIAN GODWIT.—May 15, 1914, not taken, but seen at good range with eight-power glasses and easily distinguished from either *L. fedoa*, or the Willet.

Catoptrophorus semipalmatus. WILLET.—July 24, 1904, and September 23, 1913. Also on October 15, 1915, at Broad Swamp, Cheshire.

Oxyechus vociferus. KILLDEER.—Rapidly increasing since 1914. Spring migration, April 5 to May 1. Fall records to November 22. Breeding records, June 3, 1914, on plowed land; June 9, 1914, at Broad Swamp; May 24, 1915, with four chicks not over 48 hours old in pasture land.

Perdix perdix. EUROPEAN OR HUNGARIAN GREY PARTRIDGE.—Thoroughly acclimated and breeding, eggs 12 to 24, nest usually in hay meadows or borders of pasture land.

Bonasa umbellus umbellus. RUFFED GROUSE.—Unusual nesting record, May 17, 1914, twenty-three eggs, nest at base of chestnut stump. Every egg hatched June 1 to 7. Judged by the late Wells W. Cooke to be the production of two hens.

Falco peregrinus anatum. DUCK HAWK.—Breeding on Meridea trap-rock cliffs (Hanging Hills,) summer of 1919 and 1920. Its most common prey is domestic pigeons. and in 1919 forty-four young Mallard Ducks were taken from a nearby park lake.

Aluco pratincola. BARN OWL.—Only one record, July 2, 1907, found in deep ravine, and watched for fully five minutes.

Cryptoglaux acadica acadica. SAW-WHET OWL.—Taken November 10, 1913, rose from ground and was mistaken for a Woodcock.

Melanerpes erthocephalus. RED-HEADED WOODPECKER.—Only late record, March 29, 1915, two seen. They remained in woodland and by May 25 had nested. Raised a brood and were seen until mid-summer.

Astragalinus tristis tristis. GOLDFINCH.—Late nesting record,

September 22, 1915, four eggs, nest in young apple tree September 27, hatched out two young.

Vermivora lawrence. LAWRENCE'S WARBLER.—(Hybrid) May, 1901, and May 22, 1920, perfect marking; seen at close range with eight-power glasses.

Vermivora leucobronchialis. BREWSTER'S WARBLER.—(Hybrid) May 11, 1902, and May 9, 1915. June 12, 1915. Male with female.

Vermivora pinus. BLUE-WINGED WARBLER.—Nest containing three eggs, in low bush, eight inches from the ground in the town of Westfield. Hybrid male much alarmed and close by when female was flushed.

Dendroica tigrina. CAPE MAY WARBLER.—May 19, 1912, May 12, 1914, May 26 and 29, 1917, and May 16, 1920.

Thyrothorus ludovicianus ludovicianus. CAROLINA WREN.—December 25, 1903, and January 13, 1907.

Penthestes hudsonicus littoralis. ACADIAN CHICKADEE.—October 31, 1913, one on Mt. Beseck, November 1, 1914, four in swamp land, and November 16, 1916, one in town of Berlin, Conn.—LESTER W. SMITH, 60 Cottage St., Meriden, Conn.

Some Unusual Bird-Records for Northern Vermont.—Wells River is situated in the Connecticut Valley seventy miles south of the Canadian border at an elevation of 435 feet. The Connecticut River is here joined by two streams; the Ammonoosuc from the east, having its source on the slopes of Mt. Washington, and Wells River from the west. The following records are taken from those of ten years' observation in this vicinity.

Colymbus holboellii. HOLBELL'S GREBE.—An individual spent the winter of 1919-1920 in this vicinity.

Anas platyrhynchos. MALLARD. A pair were seen October 30 and November 20, 1919.

Merula americana. REDHEAD.—An individual seen September 10, 1919, and again April 28, 1920. This bird frequented a half-mile stretch of river until May 8.

Clangula clangula americana. GOLDEN-EYE. A flock of six spent the winter of 1919-1920 on a half mile of open water between the villages of Wells River and Woodsville.

Clangula islandica. BARROW'S GOLDEN-EYE.—Four spent the winter of 1919-1920 in company with *C. c. americana*.

Porzana carolina. SORA.—One seen July 30, 1911. Several specimens have been caught by cats.

Falco s. sparverius. SPARROW HAWK.—A pair seen March 28-April 6, 1913.

Picoides articus. ARCTIC THREE-TOED WOODPECKER.—One seen September 14, 1914, and frequently during that fall and winter. During the summer of 1912 a new dam was built on the Wells River flooding about two acres of woods containing quite an amount of pine. These quickly died and were not removed until February, 1915. It was here

that the bird seemed to find everything to his liking. He disappeared at the removal of the trees and I have not seen him since. The last record is February 15, 1915.

Melanerpes erthrocephalus.—RED-HEADED WOODPECKER.—A pair have spent several seasons here nesting in a maple grove.

Empidonax virescens.—ACADIAN FLYCATCHER.—One seen August 15, 1920.

Pipilo e. erythrophthalmus. TOWHEE.—Two pairs nested here in 1916, 1919 and 1920.

Anthus rubescens. PIPIT.—A flock of four seen October 11, 1920.

Mimus polyglottos polyglottos. MOCKINGBIRD.—A pair spent the summer of 1916 here, arriving June 1.

Toxostoma rufum. BROWN THRASHER.—From one to three pairs nest every season.

Penthestes hudsonicus littoralis. ACADIAN CHICKADEE.—An individual spent the winter of 1912–1913 in company with *P. a. atricapillus* visiting a feeding table frequently.

Regulus s. satrapa. GOLDEN-CROWNED KINGLET.—A pair nested here in 1920.

Hylocichla mustelina. WOOD THRUSH.—One or two pairs nest in this vicinity every year.—WENDELL P. SMITH, *Wells River, Vt.*

Mutants.—In October, 1915, the writer shot a male English Sparrow (*Passer domesticus*) at the G. O. S. Ranch (north of Fierro), New Mexico, which was notable for having *yellow* lores and long *yellow* superciliary lines, being otherwise normal.

A male House Finch (*Carpodacus mexicanus frontalis*) was studied by the writer from May 4 to June 30, 1917, in Denver. This bird was normally colored except that its forehead, crown, and anterior occiput were *gray*, of a shade exactly matching that to be found on the head of a Hepburn's Rosy Finch, and in having a *black* circumocular area. It is fairly common, in Colorado, to find this subspecies with the males showing *yellow* rump and head, in place of *reddish*.

During the week just passed (May 8 to 15, 1921) a White-crowned Sparrow (*Zonotrichia leucophrys leucophrys*) has visited Cheeseman Park (Denver, Colo.), and was under observation repeatedly during that week. This individual was normal in coloration and color pattern in every way except that its median crown stripe was *orange* instead of *white*. Had there been no white superciliary line, this bird might have been taken very easily on hasty examination for a Golden-crowned Sparrow (*Zonotrichia coronata*).

Under whatever name one may choose to designate such departures from the normal, they are most interesting because of their possible bearing on the question of "mutation," and its relation to species formation. Perhaps a more extensive recording of such occurrences might furnish valuable hints concerning the origin of plumage color-pattern — W. H. BERGOLD, 1159 Race St., Denver, Colo.

The Criterion for the Trinomial.—Objections may well be raised to many of the late proposals of Oberholser that closely allied species be reduced to sub-specific rank. A case in point is brought up, and disposed of with vigorous show of finality, in 'The Auk' for January, 1921 (pp. 80-82). The two Cranes, the Little Brown and the Sandhill, *Grus canadensis* and *G. mexicana*, are thrown together as subspecies of one species on the ground that "the writer [Oberholser] has examined and measured a large number of these birds, and the results obtained show that while typical specimens, and in fact the majority, are readily assignable to one form or the other, the measurements . . . completely inoculate . . ." "Therefore," says Oberholser, "specific distinction cannot be maintained."

Granted the criterion, for the employment of the trinomial, of intergradation through individual variation: What *were* the figures assembled? And, furthermore, what relation did the extremes bear to age and sex as well as to geography? In this case of the cranes, where size is the chief or only character, were the "intergrades" simply small first-year birds, or were they really comparable adult individual variants?

In this connection I would call attention to some actual measurements which have been given, by Swarth ('Condor' XXI, 1919, pp. 212-213) and by Mailliard ('Condor', XXIII, 1921, pp. 30-31). There was a distinct hiatus between the largest *canadensis* examined by these men and the smallest *mexicana*. Hence, as the latter author rightly insists, they should still be considered distinct species—until proper evidence, is brought forward to the contrary. This, I contend, has not been done, even now.

A question arises as to whether an obvious "sport", a runt, say, in *mexicana* because size is the special character in the present case, should be counted as a valid intergrade. Such specimens fall outside of the polygon of normal variation in the species and, despite the claims of some mutationists, it is questionable if such aberrancies figure at all in the process of species-evolution in the wild. In other words they may have no phylogenetic significance whatever. It is important, then, that any collection of specimens representing two or more near-related forms, should be looked at critically, from various angles, before drawing conclusions. The results of hasty scanning may be wrong.

Particularly grievous are the cases involving Old World and New World forms, closely similar to be sure, but almost or quite universally, up till now, handled as binomials. I sincerely hope that the A. O. U. Committee on nomenclature will subject each one of these cases to searching inquiry, on the basis of specimens determined to be fully adult, sex as well as age being considered also. The criterion for the trinomial must *not* be closeness in general appearance, but it must be *intergradation*, either by way of geographic blending, or by way of individual variation (if this form of intergradation be insisted upon), *determined strictly as such*. If intergradation through the characters of subadults or of juvenals were generally

adopted as the subspecific criterion, what a lot of changes we would be in for. Think of the opportunities among the Empidonacæ, and the gulls!

Oberholser (*loco citato*, p. 79) implies that because a form is clearly a "geographic race," this consideration alone is a reason for employment of the trinomial. Is it necessary for him to be reminded that according to widely held current belief the great majority, if not all, of the lesser differentiated species, among the higher vertebrate animals, are but the results of geographic variation and isolation? There may be species of hybrid origin, but if so, they are relatively rare. Geography, the evolution of habitats through time, has been the *sine qua non* of vertebrate speciation: Very many good species are "merely" geographic variants.

The subspecies concept will fall, just as some few people devoutly hope it will (and we will get back to pure binomials for every form recognizable at all), if it fails to be used on a consistently definite basis. Of course there is no real phylogenetic difference between a species and a subspecies. Degree of difference is a subjective matter; and the only criterion left is that of intergradation, *actually known to exist*.—J. GRINNELL, *Museum of Vertebrate Zoology, Berkeley, California*.

RECENT LITERATURE

Beebe's 'A Monograph of the Pheasants.'—In November, 1918, appeared the first volume of Mr. William Beebe's 'Monograph of the Pheasants' which was reviewed in 'The Auk' for January, 1919. Now after a lapse of two and a half years the second volume is before us and we are informed by the New York Zoological Society, under whose auspices the work is being published, that they expect to deliver the two remaining volumes during 1922. Considering the complications in printing and publishing that we have had to face, during the past few years, the progress of this work has been most commendable.

Volume II maintains the same high standard that was set by its pre-

¹ A Monograph of the | Pheasants. | By | William Beebe, Curator of Birds of the New York Zoological Park; Fellow of the New York Zoological Society and Director of the Tropical Research Station in British Guiana; Fellow of the American Ornithologists Union and of the New York Academy of Sciences; Member of the British Ornithologists Union; | Corresponding Member of the Zoological Society of London, etc. | In Four Volumes | Volume II. | Published under the auspices of the New York Zoological Society by | H. F. and G. Witherby. | 326 High Holborn, London, England. | 1921. Royal Quarto. (12 x 16 in.) pp. I-xv + 1-269, 24 colored plates, 24 photogravures and 5 maps. Edition limited to 600 copies: price of each volume \$62.50.

decessor except, perhaps, in the quality of the color plates. The first volume was characterized by such a wealth of artistic talent, both artists and engravers, that a comparison is inevitable. In it Thorborn contributed six paintings, Lodge eight, and Knight one while of the present series Lodge furnishes nineteen and Knight two, and we miss the exquisite work of Thorborn entirely. It is in the matter of reproduction, however, that the greatest difference is to be seen, the plates, on egg-shell paper, apparently done in England, are, we think, equally good in each series, but in Volume I there were a number on smooth surface paper by Frisch of Berlin, which are unsurpassed for beauty and delicacy, while Volume II contains only one of these. We fully realize however the impossibility of having reproductions done in Berlin under present conditions, and criticism of the reproduction of the present plates would not be fair, as they are, when all has been said, exceedingly beautiful.

The two plates by C. R. Knight are hardly up to the standard and the one of the Bornean Fire-Back especially demonstrates that oil paintings are unsatisfactory as a basis for illustrations of this kind.

Gronvöld's pictures of youngbirds are admirable and the photogravures are exceedingly delicate in execution, while the landscapes are beautiful examples of photography.

The plan of this volume follows closely that of its predecessor, but we notice some additional subject headings as for instance, "Daily Round of Life," under which the life history of certain species is given in greater detail. The species considered in Volume II fall into three groups (1) the Kaleege Pheasants, (*Gennaeus*), (2) the Fire-backs and their allies (*Acomus*, *Lophura* and *Lobiophasis*) and (3) the Junglefowl (*Gallus*).

The first group is of interest on account of the great number of species that have been described. Of these Mr. Beebe recognizes only nine, regarding the other twenty-six, of which by the way no less than nineteen were described by Oates, as hybrids. These apparently all come from a narrow strip in Burma where the range of *G. lineatus* joins that of *horsfieldi* and *nycthemerus*. Many of these forms are based upon one or two individuals and in other cases no two of the specimens that have been secured are exactly alike, both of which facts tend to corroborate Mr. Beebe's views as to their status. The problem is one of great interest, however, and well worthy of the careful consideration that he gives it. Others who have studied the group may not agree as to the full specific rank of all the forms which he recognizes and may perhaps concede a place to some that he has suppressed, but the facts of the case are clearly set forth whatever the systematic value of the forms may be, and some of the hybrids are figured. These pheasants range across Asia from China to the western Himalayas in Kashmir, the silver white species on the east and the darker colored ones to the west with a distinct form in Hainan and quite aberrant ones in Formosa and in Indo-China.

The Fire-backs are found in Sumatra, Borneo and the Malay region,

Borneo having one representative of each of the three genera, with *Lophophanes*, the remarkable White-tailed Wattled Pheasant, restricted to it. While not presenting the problem of hybridism offered by the Kaleege, the Fire-backs are interesting for other reasons. In *Acomus*, for example, the sexes are remarkably similar, while in the allied *Lophura*, they are entirely different, a very peculiar condition in two genera so closely allied.

The Junglefowl naturally attract the attention of the general reader more than any other group of Pheasants from the fact that they include the Red Jungle Fowl, the ancestor of our domestic chicken. Mr. Beebe recognizes four species of these birds (1) the Red Junglefowl (*Gallus gallus*) of India, Siam, the Malay region and Sumatra, (2) the Ceylon Junglefowl (*G. lafayetti*) from Ceylon; (3) the Javan Junglefowl (*G. varius*) from Java and the islands just east of it and (4) the Gray Junglefowl (*G. sonnerati*) from central and southern India.

While Mr. Beebe has fully described the habits and habitats of the wild pheasants he has had in the case of the Red Junglefowl an opportunity to follow out the long and interesting association of a bird with mankind of which he has taken full advantage. He finds that this bird is referred to as domesticated in China as early as 1400 B. C. and was known at an early date in Persia, but is not mentioned in the old Testament. It spread, as a domestic species, westward through Asia Minor and Europe, and eventually throughout the world except in the arctic regions. In many of the Pacific Islands and the Philippines, after having been introduced as a domestic bird, it again became wild, which gave rise to claims of the existence of distinct native species in such localities. Man's interest in rearing domestic fowls has been threefold; (1) for their flesh and eggs, (2) for cock-fighting, (3) for the production of beautiful or abnormal strains, for exhibition purposes.

Under the first heading, many forms of large stature with an abundance of meat have been evolved as well as others in which the egg laying capacity has been increased from the normal set of 4 to 8 eggs to no less than 196 a year, which is a recorded average number for 600 hens in one American poultry yard. Along with this tremendous egg laying power, however, these birds have lost all instinct to incubate and will no longer hatch their own eggs. Game chickens require comparatively no "breeding" as the wild Junglefowl was an adept fighter and this race of fowl has thus ever remained closest to the wild strain.

Among the results of artificial breeding are the long-tailed Japanese fowls, the tail feathers of which have reached the extraordinary length of twenty feet, two inches. This development is said to be due to a suppression of the molt, the feathers growing continuously, but this is difficult to understand in view of our present knowledge of feather growth and development, and a little more detailed information on the matter would have been welcome.

Another development of the "chicken fancier" is the curious Seabright race in which the cock is exactly like the hen.

The nomenclature of domestic chickens seems to be sadly confused as we learn that the so-called Cochin China fowls originated in Shanghai, and the Bramas in America.

The other species of wild Junglefowl have not figured extensively in domestication but Mr. Beebe's account of the hybridising of the Javan species is interesting and amusing. The wild cock when crossed with a domestic hen produces a bird with a remarkable penetrating and raucous voice which can be heard for a mile or more. These birds are highly prized by the natives and are matched against one another not as fighters, but as vocalists, and prove quite as satisfactory subjects upon which to wager money as do the game cocks. They are kept singly in wicker baskets hung high above the houses on tall bamboo poles where they crow continually, and keep in good voice.

Mr. Beebe's book is replete with interesting information while the pen pictures of the homes of the wild pheasants and his experiences in trailing them, are written in his familiar graphic style and we are taken successively to the higher slopes of the Himalayas, to the dense Malay jungles and to the islands of the tropical seas, wherever these beautiful birds exist. We heartily congratulate him and his publishers upon the successful progress that they are making with this notable work. It seems proper too, in this connection to recall the fact, that may not be known to all of our readers, that for the first volume of the 'Pheasants' Mr. Beebe was awarded the Daniel Giraud Elliot medal by the National Academy of Sciences.—W. S.

Mathews' and Iredale's 'A Manual of the Birds of Australia.'¹—With his monumental work 'The Birds of Australia' well on the way to completion, Mr. Mathews has begun, in conjunction with Mr. Tom Iredale, what we presume will be his last word on the subject—'A Manual of the Birds of Australia.' This work, in four volumes, small quarto, will consist of a condensed presentation of the matter contained in the larger work, with such alterations or emendations as the authors deem desirable. It will thus bear the same relation to 'The Birds of Australia' as Gould's 'Handbook' does to his large folio.

The plan of the work judged by Volume I is admirable. The higher groups are well diagnosed while under each genus and species is a synonymy of original references, with accurate dates, the working out of which has formed such an important part of Mr. Mathews' researches. Under the species there are also references to the plates and a brief statement of distribution.

¹ A Manual of the Birds of Australia by Gregory M. Mathews, F. R. S. E., M. R. A. O. U., and Tom Iredale, Members of the British Ornithologists Union and Corresponding Fellows of the American Ornithologists Union. Illustrated with Coloured and Monochrome Plates by Lillian Medland. Volume I. Orders Casuarii to Columbæ. H. F. & G. Witherby, 326 High Holborn, London. 1921. pp. 1-279. pls. 1-X, and I-XXXVI. Crown 4, Price £ 3.35. per vol.

The main text is divided under the following headings: Description of plumage of adult, immature and chick; description of nest, and eggs; date of breeding season, time of incubation, and a discussion of distribution and forms. In the last category the subspecies are considered with extreme brevity, the typical race being mentioned by name with geographic range only, and the others contrasted with it, as "a darker race," "lighter and larger," etc. We have usually no means of ascertaining whether the description in the main text is based upon the typical subspecies or not. From the method of comparing the several races as described above, it would appear that it is, but when the "typical" form is not found in Australia it is hardly conceivable that the extra-limital bird is the one described. It is unfortunate that the authors are not more definite upon this point and the inclusion of the subspecific names in the synonymy on exactly the same basis as pure synonyms is another mistake. Subspecies must either be ignored entirely or adequately recognized; any half-way method only leads to confusion and misunderstanding. Another unfortunate point is the use of such a hackneyed word as "immature" in connection with plumage. With such definite discussions of plumage-stages as those of Dwight, Witherby and others, easily available, the authors might reasonably have been expected to tell us whether it is the "juvenal", "first winter" or some other "immature" plumage that they are describing.

These criticisms are however technical and as a rule do not affect the general usefulness of this important work, which, from its greater accessibility will probably be our standard reference book on Australian ornithology for some time to come.

The plates are numerous and admirable. Those in color represent mainly "chicks" (= natal plumage) of various species while the others illustrate structural characters of the various genera and are from wash drawings instead of outlines as is usually the case.

The only criticism to be made of the plates is in their numbering, there being two series, so that Plate 10, Vol. 1, may refer to either of two entirely different illustrations. Furthermore, there is no reference to any of the plates in the text to which they refer, and one may labor with the brief descriptions of the races of the Silver Gull without having any idea that at the end of the volume there is an excellent plate showing the differences in their wing markings.

Seven new subspecies are proposed in the text where they would readily be overlooked were it not for a list given in the preface.

One feature of this work, which will only appeal to experts on nomenclature is the admirable detail and accuracy of the synonymy, which will of necessity be consulted, especially as regards the genera, by ornithologists who have little or no interest in the avifauna of Australia.

We wish the authors all speed with the remaining volumes, although we realize that this work must of necessity follow along after the larger one, so that Volume V can hardly be expected until the latter is finished—W. S.

Mathews 'The Birds of Australia.'¹—The last part of Mr. Mathews' large work continues the treatment of the flycatchers, covering the genera *Machaerorhynchus*, *Seisura*, *Piezorhynchus*, *Monarcha*, etc. We notice but one new form, *Seisura inquieta rogersi* (p. 68) from Derby.—W. S.

Dr. Patch's 'Bird Stories'²—These stories intended for bird students, "Junior Audubon Classes and other boys and girls who are friendly to birds," forms another of the series being published by the Atlantic Monthly Press, under the title of 'Little Gateways to Science.' The twelve stories treat of the life histories of the Chickadee, Herring Gull, Spotted Sandpiper, Loon, Cliff Swallow, Bald Eagle, Crow, Snowy Heron, Nighthawk, Passenger Pigeon, Screech Owl and Bobolink. The birds are given distinctive names and each becomes as it were, the hero of his particular story, developing a personality that cannot fail to hold the attention of the child.

This form of nature story so much in vogue at present is easily abused and too often fact is lost sight of in the desire to intensify the dramatic qualities. Dr. Patch, however, seems to have been particularly careful in this respect and has succeeded in bringing in an astonishing amount of solid information without detracting from the interest of the story.

The 'Notes' at the end of the volume as well as the bibliography show her thorough knowledge of the literature of the subject.

We cannot have too much attention directed to the conservation of nature if we are to save any remnant of our wild country and wild life for future generations, and such books as this, which aim to instill the principles of conservation in the young children, are especially welcome.—W. S.

Witherby's 'Handbook of British Birds'³.—The present part, completes the Owls and covers all of the Accipitres but the Osprey and Vultures. It contains much valuable information on plumages especially on the development of the down, and is of particular interest to American ornithologists as so many of the species are closely allied to ours. In this connection it is to be noted that the opinions of several recent writers are followed with regard to the relationship of American and European forms. All of our Gyrfalcons seem to be referred to the Greenland Falcon, *Falco rusticolus candicans* Gm; our Marsh Hawk becomes a subspecies of *Circus cyaneus* and our Goshawk of *Accipiter gentilis*. The genera *Archibuteo*, *Cerchneis* and *Astur* are not recognized.—W. S.

¹ The Birds of Australia. By Gregory M. Mathews. April 15, 1921, pp. 49-96.

² By Edith M. Patch. With Illustrations by Robert J. Sim. The Atlantic Monthly Press. Boston (1921).

³ A Practical Handbook of British Birds, edited by H. F. Witherby, Part X, pp. 81-176. March 1, 1921. Price 4 s. 6 d. per part.

Miss Cooke's List of Washington Birds.¹—The birds of the region about the national capital were first listed by Coues and Prentiss in 1861 when 225 species were recorded. Their revised list of 1883 brought the number up to 248, while Richmond's list of 1902 advanced it to 291. Prof. Cooke, 1908 and 1913, gives 294, two of which were hybrids, and his daughter in the present list brings the number to 299 species and sub-species besides two hybrids and two hypothetical forms.

Her treatment is under three headings (1) Permanent Residents—a mere list with a few comments on comparative rarity. (2) Rare, Irregular or Accidental Visitants—with full dates and authorities for all records, but in most cases no distinction between sight records and specimens secured. (3) Regular Migrants—arranged in a table with earliest, latest and average dates for each. The Northern Robin is mentioned in a footnote as a migrant but does not appear in any of the tables.

This carefully prepared list will be of great value to the Washington ornithologists and to those of other regions who are interested in the comparison of migration dates.—W. S.

Riley on New Genera.²—Mr. Riley in studying a collection of birds from Celebes finds that several species from that island do not seem to belong to any of the current genera and therefore proposes the following new genera for their reception: *Compsoenas* (p. 51) for *Columba radiata* Q. & G., *Lamprura* (p. 51) for *C. rufigaster* Q. & G., *Diopexus* (p. 52) for *Phlegoenas tristigmata* Bp.; *Cranobronies* (p. 52) for *Buceros leucocephalus* Vieill. and *Orodytes* (p. 52) for *Arachnothera celebensis* Meyer and Wieglesw.

In another paper³ Mr. Riley describe four additional new Celebes birds from the collection made by Mr. H. C. Raven. These are *Scolopax celebensis* (p. 55); *Dendrobiastes hyperythra jugosae* (p. 56), *Myzomela chloroptera juga* (p. 56) and *Lamprocorax montosa* (p. 57).—W. S.

Chapin on New Birds from the Belgian Congo.⁴—The four interesting birds described in the present paper were all secured on the American Museum's Congo Expedition. *Astur toussenellii canescens* (p. 1), *Batisituriensis* (p. 5) and *Terpsiphone batesi* (p. 6) are from the Ituri District, while *Colius nigricollis leucophthalmus* (p. 2) is from the Nele District.—W. S.

¹ Birds of the Washington Region. By May Thatcher Cooke. Proc. Biol. Soc. Washington, Vol. 34, pp. 1-22. March 31, 1921.

² Five New Genera of Birds. By J. H. Riley. Proc. Biol. Soc. Washington, Vol. 34, pp. 51-53. March 31, 1921.

³ Four New Birds from Celebras. Proc. Biol. Soc. Wash. 34, pp. 55-58. March 31, 1921.

⁴ Descriptions of Four New Birds from the Belgian Congo. By James P. Chapin. American Museum Novitates, No. 7, April 4, 1921, pp. 1-9.

Mabbott, on the Food Habits of Seven Shoal-Water Ducks¹.—

In 1918 Mr. W. L. McAtee published (Bull. 720 U. S. Dept of Agriculture) an account of the food habits of the Mallard and Black Ducks and the late Mr. Mabbott in the present paper has covered the other river ducks—the Gadwall, Baldpate, Teal, Pintail and Wood Duck. The Shoveller seems to have been omitted although the European Widgeon, a mere straggler in America, has been included.

These reports are published as a result of the recent increase in duck farming in the United States and the consequent demand for information on the natural food of the several species. The food of these river ducks is found to be from 70 to 98 per cent. vegetable, pond weeds and sedge seeds predominating, while the animal food is mainly confined to certain mollusks and aquatic insects.

The data are compiled mainly from autumn and winter specimens and food habits during the nesting season may be found to differ to some extent. The food of the same species in different localities must vary very considerably and in the case of the Wood Duck the high percentage of cones of the bald cypress consumed would fall off completely in those parts of the country lying north of the range of this tree. In the summary published five-eighths of the specimens examined were from Louisiana which of course accounts for the prominence of this item of food. ♦

Mr. Mabbott had prepared a valuable report and it is fortunate that it was left in such shape that its publication was possible. While all will honor his prompt response to his country's call and the supreme sacrifice that he made, it is a matter of deep regret that such a promising young ornithologist must needs be cut down at the very beginning of his career.—W. S.

Shufeldt on Pictures of the Passenger Pigeon.²—This paper, read at the 1920 meeting of the American Ornithologists' Union, gives an interesting summary of the various illustrations of the Passenger Pigeon known to the author with some history of the works in which they appear. It forms a valuable contribution to the history of this famous bird, covering, as it does, ground that has been almost entirely neglected. Discussion at the meeting, when it was presented, demonstrated how very few persons there are still living who can accurately describe the appearance and actions of this species, or can judge authoritatively of the relative merits of its portraits. Dr. Shufeldt has added greatly to the value of his paper by furnishing photographic reproductions of twelve of the best published

¹ Food Habits of Seven Species of American Shoal-water Ducks. By Douglas C. Mabbott, Assistant in Economic Ornithology. Bull. 862. U. S. Dept. Agriculture. December 30, 1920. pp. 1-67. Price 25 cts. (Order from Supt. of Documents, Gov. Printing Office, Washington, D. C.)

² Published Figures and Plates of the Extinct Passenger Pigeon. By Dr. R. W. Shufeldt. Scientific Monthly. May, 1921, pp. 457-480.

plates of the bird together with several of the last individual, taken from life, and after it had been mounted by the late Nelson R. Wood. Incidentally he states that the plates of Wilson's 'Ornithology' were engraved by Warnicke but we are at a loss to know what authority he has for the statement. If the great majority of them are not the work of Lawson it is high time that proof of the fact were presented.—W. S.

Lincoln's Instructions for Bird Banding.¹—This is a clear and concise series of instructions on how to band birds, how to catch them for banding and study, and how to keep the necessary records. So many important problems can be solved by thus tagging birds, and keeping records of their recapture at the same place or elsewhere, that the Biological Survey has adopted the practise as one of its regular lines of research and volunteers are solicited to aid in the banding. The present pamphlet is issued especially to furnish the necessary instructions for carrying on the work. It seems to admirably fill the requirements.—W. S.

Murphy on the Sea Coast and Islands of Peru, IV and V.²—Dr. Murphy continues in the 'Brooklyn Museum Quarterly' his interesting account of his recent trip to the Peruvian coast. One installment deals with the Chincha Islands and the Guano industry and is prefaced with an account of a visit there fifty years ago by Dr. Frederick A. Lucas, which was written at Dr. Murphy's request to contrast conditions at that time with those of today. The other installment relates to the ancient mummies of the coast region and to Independencia Bay where the Chilean Flamingo was found.—W. S.

Speck on Bird-Lore of the Northern Indians.³—This is a delightfully written account of the fables and beliefs of the Penobscot Indians which relate to the wild birds. The Great Auk we learn was regarded as the chief of a tribe which is visited by the chief deity of the Penobscots when his uncle desires to secure a wife. The Petrel's name in the Penobscot language means "picking up grease," referring to the bird's habit of skimming the surface of the water. The Owls, to the primitive Indian mind, were of deep portent and almost all the species are distinguished by name.

The Redstart is "little fire," and the Thrushes, "birds of evening,"

¹ Instructions for Bird Banding. By Frederick C. Lincoln. U. S. Dept. Agr. Department Circular 170. April 1921. pp. 1-18. Price 5 cents (from Supt. Documents, Government Printing Office).

² Brooklyn Museum Quarterly January, 1921, pp. 1-28 and April, 1921, pp. 35-55.

³ Bird-Lore of the Northern Indians. By Frank G. Speck. Reprint from Volume VII, Public Lectures by University of Pennsylvania Faculty, 1919-20. Philadelphia, Pa. Published by the University, 1921.

while others are named in imitation of their calls as in the case of the Whip-poor-will, which to the Penobscots seems to say "wipolessu." The part that birds play in folk-lore is always interesting and Dr. Speck's paper covers an important branch of this subject.—W. S.

Year Book of the Rhinebeck Bird Club.¹—Besides the general reports of the Club there are articles on the Barn Owl by G. W. Gray; the Evening Grosbeak by Dorothy Cookingham; the Barred Owl by Clinton G. Abbott, and a preliminary list of the birds of Dutchess Co., N. Y., by Maunsell S. Crosby. The White Swans originally liberated at Rhinebeck some years ago have bred wild and now number 26 individuals.—W. S.

Wetmore on the Ducks of the Bear River Marshes, Utah.¹—While engaged in studying the duck sickness which has recently become prevalent in Utah, and upon which he has already reported, Dr. Wetmore gathered much information on the life history and favorite foods of the ducks of this region which has been embodied in the present bulletin for the benefit of sportsmen and others interested in water-fowl.

One of the most interesting portions of the report is that dealing with the "eclipse" plumage which was studied in life by Dr. Wetmore. The Drakes of all the resident species except the Ruddy Duck, desert the female, in almost every case, as soon as incubation begins, gathering together in large flocks. Early in summer they molt their bright plumage and assume the dull "eclipse" dress and lose their flight feathers. They then take to the thick marsh growth where they remain in concealment until they are again able to fly. The new normal plumage coming in in September. The females are naturally later in molting than the males and are not in full feather again until late October. The male Canada Goose accompanies the young, as does the Ruddy Duck, and, nesting early, they are able to start the molt by the end of May. It is completed about the time the young goslings are able to fly and the flocks are in evidence again, on the bay, by early July. The Geese are exceedingly wary when hiding during their flightless stage and are rarely seen.

The report contains much valuable data on food plants, and on the enemies and conditions affecting water-fowl.

The importance of the region as a resort of the birds during the molt is emphasized.—W. S.

¹ Year Book of the Rhinebeck Bird Club for the years 1918, 1919, 1920. Published by the Rhinebeck Bird Club, Rhinebeck, N. Y. 1921 pp. 1-40, numerous plates.

¹ Wild Ducks and Duck Foods of the Bear River Marshes, Utah. Bull. 932 U. S. Dept. Agriculture. pp 1-20. pls. I-III, May 31, 1921. Price 5 cent. (from Sup't, Documents Gov't. Printing House).

Food Habits of the Ring-neck Pheasant.—A recent Circular¹ of the Colorado Agricultural College contains statements of the crop and stomach contents of 60 Ring-necked Pheasants collected in Colorado. No estimates of the proportions of the various food items are given and it is rather difficult to grasp the import of the data presented. The general conclusions drawn by the persons, Messrs. W. L. Burnett and Asa C. Mayson, making the stomach examinations are that the food of the pheasant is largely vegetable, including much grain, that the birds show no preference for insect food and are very indifferent to grasshoppers, that the birds damage corn, wheat and other field and garden crops, and that their value to agriculture has been overestimated.—W. L. M.

Recent Reports on Game and Bird Conservation.—Glancing over the constantly increasing number of publications dealing with bird and game protection, we find a picture in 'California Fish and Game,' for April, of 1531 Blue Jays killed in a Blue Jay hunt by sportsmen at Hollister, Calif., under the impression that these Jays eat the eggs of game birds and should therefore be exterminated. This slaughter seems, as the editor suggests, of doubtful benefit. As we have always maintained the upsetting of nature's balance by extermination of any species is a matter deserving the most careful consideration.

'Bird Notes and News' [England] tells us once more of the shameful way in which action on the plumage importation bill is held up again and again in Parliament.

'The Gull,' the organ of the Audubon Association of the Pacific, continues to publish live notes of interest to bird protectionists on the coast, as does the 'New Jersey Audubon Bulletin' for the state which it covers. From the latter we learn that the State Legislature at its last session placed the Bobolink on the list of protected birds where it was prior to the alteration in the migratory bird treaty regulations.

'Fins, Feathers and Fur' has much of interest to Minnesota conservationists and includes a good article on winter bird life in that State for the season of 1920-21 by Thaddeus Surber.

The April 'Bulletin of the American Game Protective Association' has a report on Ring-necked Pheasant breeding and a report of a delightful speech by Dr. Loye Holmes Miller on music of the woods.

The Illinois State Government publishes a 'Circular' on Arbor and Bird Days which is profusely illustrated and full of valuable hints for school work.—W. S.

¹A Study of the Food Habits of the Ring-necked Pheasant in Colorado. W. L. Burnett. Feeding Habits and Food of the Ring-necked Pheasant. By Asa C. Maxon. Circular 31. Colo. Agric. College, Ft. Collins, Colo. February, 1921.

The Ornithological Journals

Bird-Lore. XXIII, No. 2. March-April, 1921.

Winter Bird Life in Los Angeles. By Harriet W. Myers.

The Bird-House for Purple Martins. By Thos. L. McConnell.—Many good practical suggestions, which show what apparently trivial matters affect the birds.

The migration data and plumage paper deal with the Meadowlarks and Yellow-headed Blackbird.

Bird-Lore. XXIII, No. 3. May-June, 1921.

John Burroughs, 1837-1921.—A beautiful tribute by Frank M. Chapman.

Why do Birds Bathe? II. By E. T. Seton.—Comments aroused by the previous article on this subject, containing much valuable information on bird baths.

The Great Horned Owl is the subject of the Educational Leaflet by T. Gilbert Pearson.

The Condor. XXIII, No. 2. March-April, 1921.

The Biography of Nip and Tuck. A Study of Instincts in Birds. By Loye Miller.—A delightfully written paper conveying facts of the greatest importance in a humorous narrative form. Among other things the young House Finch develops the call note and song of its species, in spite of the fact that it had never heard either, and had been constantly confronted with the notes of a Canyon Wren. This is in direct contradiction to the alleged results of a similar experience published some years ago by another writer.

Notes on two Characteristic Birds of the San Gabriel Wash. By Robert S. Woods.—Cactus Wren and Costa's Hummingbird.

The Pribilof Sandpiper. By G. Dallas Hanna.—An excellent biography from personal experience.

Notes from Southern Arizona. By H. H. Kimball.

The Sitkan Race of the Dusky Grouse. By H. S. Swarth.—*Dendragapus obscurus sitkensis* (p. 59), Kupreanof Island, south-eastern Alaska.

Further Notes on Birds Observed near Williams, Arizona. By Alexander Wetmore.—Notes on 44 species.

The Condor. XXIII, No. 3, May-June, 1921.

Notes on the Nesting of the Yosemite Fox Sparrow, Calliope Hummingbird and Western Wood Pewee at Lake Tahoe, California. By John W. Mailliard.

The Probable Status of the Pacific Coast Skuas. By A. C. Bent.—Identifies all Pacific coast birds provisionally as *C. chilensis* (Bp.) a species new to the United States.

Nesting of the Stephens Fox Sparrow. By Wright M. Pierce.

Weights and Plumage of Ducks in the Rio Grande Valley. By A. Leopold.

A Bird Census at Prescott, Walla Walla County, Washington. By L. R. Dice.

Additional Notes on the Water and Shore Birds of Netart's Bay, Oregon. By Stanley G. Jewett.

New Bird Records for North America. With Notes on the Pribilof Island List. By Joseph Mailliard and G. Dallas Hanua.—*Micropus pacificus* and *Lanius mollis* from the Pribilofs, new to North America.

The Wilson Bulletin. XXXIII, No. 1. March, 1921.

Nesting of Bachman's Sparrow. By Albert F. Ganier.

Comparative Periods of Nesting Life of some North American Nidicolae. By Frank L. Burns.

Notes on the Habits of the Breeding Water Birds of Chatham County, Georgia. By W. J. Erichsen.

Wilson Bulletin. XXXIII, No. 2. June, 1921.

Migrant Shrike. By I. N. Gabrielson.—A nest study.

Bird Banding in Northern Michigan during the Season of 1920. By Dayton Stoner.

The Oölogist. XXXVIII, No. 2. February 1, 1921.

Birds of Yakima County, Washington. By J. B. Hurley.

Some Winter Birds of Perry County, Alabama. By Prewitt Roberts.

Rare and Uncommon Birds, Lawrence County, Mo. By Johnson Neff.

The Oölogist. XXXVIII, No. 3. March 1, 1921.

Nesting of the American Hawk Owl. By E. S. Norman.

The Ibis. (11 series) III, No. 2. April, 1921.

Field Notes on the Birds of Macedonia. With special reference to the Struma Plain. By F. N. Chasen.

Velocity of Migratory Flight among Birds. By Col. R. Meinertzhagen.—Considers that birds do not accelerate their speed when migrating. Gives a mass of data on speed of various species.

Field Notes on the Birds of Lower Egypt. By W. Raw.

The Birds of Tasso and Adjoining Islands of the Rokelle River, Sierra Leone. By Willoughby P. Lowe.

A Systematic List of the Birds of Sierra Leone. By David A. Bannerman.

J. F. Miller's Icones. By C. Davies Sherborn and Tom Iredale.

Report of the Sub-committee, consisting of Dr. E. Hartert, Messrs. T. Iredale and W. L. Sclater on amendments and proposed alterations to the names in the B. O. U. 'List of British Birds', as accepted by the Committee of the B. O. U. on the British Birds List.

"The Last Phase of the Subspecies," a letter from Messrs. P. R. Lowe and C. Mackworth-Praed in reply to one from L. M. Loomis in the October 'Ibis', is a very interesting contribution to the subspecies question. These gentlemen seem to regard the species and subspecies as two different things, but how they are to be distinguished in actual practice except by the arbitrary establishment of some sort of criterion of intergradation they do not explain. Practice shows that there is as wide a diversity of opinion at the present time on this matter as there has been in the past. As witness

our American Juncos. Again they say very confidently that "by far the majority of our present-day subspecific forms belong to this last category, i. e., variations directly due to the action of environment and are mere environmental, unstable and essentially superficial variations, which would quickly disappear if the organism were transferred from its normal environment to some other of a different nature." They evidently are unfamiliar with Professor F. B. Sumner's experiments with mice in California where dark colored forms have bred true ever since they were transferred to a desert environment, where the native race was pale-colored. We have too much evidence of the stability of sub-species to warrant their dismissal in such offhand fashion. Dr. Joseph Grinnell on a previous page of the present Journal sums the matter up concisely when he says "there is no phylogenetic difference between the species and the subspecies."

Bulletin of the British Ornithologists' Club. No. CCLVII.

Lord Rothschild and Dr. Hartert describe *Turdus joiceyi* (p. 74) from Ceram; Mr. D. A. Bannerman, *Malimbus rubricollis nigeriae* (p. 77) and *M. r. praedi* (p. 78) from southern Nigeria and northern Angola, and Mr. C. Chubb, *Pseudosicalis* (p. 78) new genus for *Pseudochloris auri-ventris*, and *Notiocorys abariensis* (p. 79) from British Guiana.

Bulletin of the British Ornithologists' Club. No. CCLVIII.

Mr. E. C. Stuart Baker describes *Arboricola torqueola millardi* (p. 101) from Koteghur, Himalayas. Dr. Van Someren describes sixteen new African birds from specimens in the Tring Museum.

Bulletin of the British Ornithologists' Club. No. CCLIX.

Mr. E. C. Stuart Baker describes *Dicaeum chrysorrhoeum intensum* (p. 108) Sikkim and *D. trigonostigma rubropygium* (p. 108) Mergui. Dr. Percy R. Lowe describes *Thinocorus rumicivorus bolivianus* (p. 109) Bolivia, *T. peruvianus* (p. 109) Peru, *Attagis cheeputi* (p. 109) Patagonia, *Numenius phaeopus alboaxillaris* (p. 110) E. Africa, and *Belonopterus cayennensis molina* (p. 111). Lord Rothschild proposes *Thinocorus rumicivorus venturii* (p. 111) Buenos Aires and Mr. Mackworth-Praed, *Franco-linus hildebrandti lindi* (p. 111), while Dr. Van Someren has fourteen more new African birds.

Bulletin of the British Ornithologists' Club. CCLX.

Dr. Van Someren contributes descriptions of nineteen new African birds and the following are described by Dr. Hartert, *Pycnonotus barbatus nigeriae* (p. 126) So. Nigeria; by Mr. D. A. Bannerman *Nigrita canicapilla angolensis* (p. 126) N. Angola and by Lord Rothschild, *Paradisea mixta* (p. 127) locality unknown.

British Birds. XIV, No. 10, March 1, 1921.

A Third Season's Observations on a Cuckoo. By Edgar Chance.—A most interesting study. A single Cuckoo laid 21 eggs in a season all in Meadow Pipits' nests. She sat on a limb near a nest and watched it intently for an hour or two, then flew heavily to its side, deposited an egg,

placed it in the nest, removing one of the Pipit's eggs and flew off again. This is a brief statement of the author's conclusions on the manner of depositing the egg.

British Birds. XIV, No. 11. April 1, 1921.

Ornithological Notes from Norfolk for 1920. 27th Annual Report. By J. H. Gurney.

Notes for Seasons 1918-19-20, on the Irish Colonies of Sandwich and Roseate Terns. By C. J. Carroll.

British Birds. XIV, No. 12. May 2, 1921.

Bird Photography on a City Lake. By G. C. S. Ingram.

"Territory in Bird Life." A review of Mr. Howard's notable book by H. G. Alexander who "already held" the same theory.

British Birds. XV, No. 1. June 1, 1921.

Homing Ability in the Nestling Willow Warbler. By J. M. Dewar.—Chicks with eyes closed were experimented with and invariably turned more or less completely around before advancing, so that they only got back to the nest when they were headed in the same direction as they had assumed when sitting in it.

Some Notes on the Rook. By Stanley Crook.—Admirable photographic illustrations.

Avicultural Magazine. (III series) XII, No. 2. February, 1921.

The Mallee Fowl of Australia. By T. P. Belchambers.—Life History.

Quail Breeding in Japan. By N. Taka-Tsukasa.—Reared and kept in captivity for their song.

Avicultural Magazine. (III series) XII, No. 3. March, 1921.

Some Corsican Birds. By Sydney Porter.

Avicultural Magazine. (III series) XII, No. 4. April, 1921.

Longevity in Cage Birds. By A. G. Butler.—A Napoleon Weaver Finch has lived in his aviary for twenty-one years.

The Emu. XX, Part 4. April, 1921.

Second Trip to Macpherson Range, South-east Queensland. By S. W. Jackson.

The Nature of the New Zealand Avifauna. By Gregory M. Mathews and Tom Iredale.

A New Menura; Prince Edward's Lyre-Bird. By A. Chrisholm.

The Tubinaria (Petrels and Albatrosses) in the Gould Collection at Philadelphia. By W. B. Alexander.

Birds Visiting Cape York Peninsula and New Guinea. By H. G. Vidgen.

Notes on the Domestic Habits of the Spotted-sided Finch (*Steganopleura guttata*.) By Mrs. S. T. W. Norton.

Notes on Birds of Prey from Casterton, Victoria. By C. E. Simson.

The South Australian Ornithologist. VI, Part I. January 1, 1921.

Description of a New Wren. By J. W. Mellor.—*Leggeornis lamberti eyrei* (n. 10), Warunda Creek, S. Australia.

Bird Notes from the Lake Frome District of South Australia. By J. N. McGilp.—Additional notes in next issue.

Notes on a Motor Trip from Adelaide to Western Queensland. By F. E. Parsons.

The South Australian Ornithologist. VI, Part 2. April 1, 1921.

Notes on Birds met with during a Visit to South-west Queensland. By A. Chenery.

New Scrub Wren. By J. W. Mellor —*Sericornis maculata geraldtonensis* (p. 43) Geraldton Dist., W. Australia.

A New Scrub Wren from Houtman's Abrolhos, Western Australia. By F. R. Zietz. *S. m. houtmanensis* (p. 44).

L'Oiseau. II, No. 1. January, 1921. [In French.]

On *Lalage rufiventris*. By P. Carie.—With colored plates of bird and nest.

Experiences in Breeding the Hoopoe. B. G. Cordier [See also No. 3].

L'Oiseau. II, No. 2. February, 1921.

Recollections of a Naturalist in French West Africa. On *Cryptorrhinus* *afra*. By Dr. Millet-Horsin. [*Turacus buffoni* in No. 3.]

On *Alectoris collolaema* Salv. and Festa.

Revue Française d'Ornithologie. No. 143. March 7, 1921. [In French.]

Study of a Collection of Birds from Equatorial Africa. By J. Berlios.

Revue Française d'Ornithologie. No. 145. May 7, 1921. [In French.]

Contribution to a Study of the Mediterranean Forms of the Peregrine Falcon. By L. Lavanden.

Review of Dr. F. Cathelin's 'Les Migrations des Oiseaux.' Published in Paris, in 1920.

Le Gerfaut. X, No. 4, 1920. [In French.]

A Nest of the Black Woodpecker. By M. Mairlot.

Nesting of the Black Kites in Belgium. By A. Galasse.

Le Gerfaut. XI, No. 1, 1921. [In French.]

Ornithological Excursion to the Battlefield of Flanders.

Yearbook of the Netherlands Ornithological Society. No. II. Aft. 1, 1921. [In Dutch and German.]

Ornithological Studies in Gajo-land. By F. C. Van Heurn and Dr. R. C. E. G. J. Baron Snouckaert van Schauburg.—Annotated list of species observed in this part of Sumatra.

The Birds of Homer. By J. S.

Our Knowledge of Certain Sumatran Woodpeckers. By E. Stresemann. [In German.]—*Chrysocolaptes* spp.

The Black-throated Grebe. By van Dedem.

On Quadrinomial Nomenclature and its Application to Ornithology. By A. Laubmann.

Ornithologische Monatsberichte. 29, No. 5-6. May-June, 1921. [In German.]

On the Molt of the Primaries in Alcedinidae. By E. Stresemann.—

Describes the irregularity in the order of molt in the Kingfisher, first, we believe, pointed out by the reviewer in 1898.

On the Forms of *Parisoma subcaeruleum*. By O. Graf Zedlitz.—*P. s. ansorgi* (p. 52) from Benguela, Africa, is described as new.

Journal für Ornithologie. 69, No. 2. April, 1921. [In German.]

On a Collection of Birds from West Usambara. By H. Grote.—Contains annotations on 133 species, the following being described as new, *Caprimulgus pectoralis guttifer* (p. 125).

On the Ornithology of North-eastern France. By L. Schuster.

On the Long-crested Turacous. By Reichenow.—Recognizes five forms.

Remarks on *Buteo vulpinus* By E. Stresemann.

The Question of Mimicry in Cuckoo's Eggs. By F. von Lucanus.—In the report of the February meeting of the German Ornithological Society Dr. Reichenow describes seven new forms *Arboricola collaris* (p. 263) Kuantung China; *Turtur logonensis* (p. 263) Bekaba, East Cameroon; *T. kafuensis* (p. 264), Namwala, S. Africa; *T. capricola suahelicus* (p. 264), East Africa; *Alseonax murina grolei* (p. 264), East Cameroon; *Apalis niassae* (p. 264), Langenburg, Niassa, and *A. namensis* (p. 264), Bosum, East Cameroon.

One description consists of a line and a half, the only character being "brown of the upper parts paler" than in an allied form. Others are equally careless. No types are mentioned and rarely any indication of the material at hand.

Aquila. XXVII. 1920. [In Hungarian and German.]

Consists largely of an account of the life and works of Nicolas Zeyk. By Jacob Schenk, with a publication of some of his manuscripts.

Bird Notes. IV, No. 2. February, 1921.

Field Notes from Mashonaland. By Guy Falkner.

Observations on Some Hybrids of the Ploceidae. By A. De Coux.

Numerous admirable articles on aviaries in this and other recent issues.

Ornithological Articles in Other Journals

Barter, E. V. and L. J. Rintoul. The Pintail as a Scottish Breeding Species. (Scottish Naturalist, March-April, 1921, No. 111-112.)—A full resumé of occurrences.

Harper, R. M. Geography of Central Florida. (Thirteenth Annual Report, Florida Geol. Survey, 1921.)—The bird matter is brief and compiled.

Pohlman, A. G. Have Birds an Acute Sense of Sound Location? (Science, May 6, 1921.)—It would seem that birds have great acuteness in hearing and also a definite ability in determining the direction of the sound source.

Shufeldt, R. W. Life History of the Black Skimmer or Scissor-Bill.

(Nature Study Review, April, 1920.)—This number of the Review is full of information on bird study.

Beck, Rollo H. Bird Collecting in the Highlands of Santo Domingo. (Natural History, XXI, No. 1, January–February, 1921.)—An extremely interesting article on the interior of the island.

Blaauw, F. E. Days with the Birds of Tierra Del Fuego. (Ibid.)—Beautifully illustrated account of the recent visit to southern Paragonia.

Chapman, F. M. Courtenay Brandreth's Bird Paintings. (Ibid.)—Reproductions of some of the artist's beautiful paintings and comments thereon. If those who set out to paint birds would read Dr. Chapman's article they would profit materially—or give up the attempt. As he truly says the painter of birds must know and study the bird in life until he is thoroughly familiar with each species—its own special traits actions, disposition, etc. And yet how often do we see the attempt made with nothing but a badly mounted specimen as a foundation!

Mershon, W. B. The Dance of the Sand Hill Crane.—(Michigan Tradesman, April 1, 1921.)—Interesting account of the weird performance of these birds in Kidder Co., N. Dakota, about 1889.

Bangs, O., and Penard, T. E. (1) *Lophotriccus* versus *Cometornis*. (Proc. Biol. Soc., Washington, 34, p. 78, March 31, 1921.)—Owing to an earlier overlooked citation of type for the former genus, the changes recently proposed by these authors become unnecessary and *Lophotriccus* and *Calopteryx* remain as previously recognized. (2) A new name for *Pachyrhamphus polychopterus costaricensis* Chubb.—*P. p. tantalus* is proposed. (Ibid. p. 78.)

Oberholser, Harry C. *Textor* Temminck versus *Alecto* Lesson. *Hyphantornis* Gray becomes *Textor* Temminck. (Ibid. p. 79.)—An earlier use of *Textor* for another species (*Oriolus cucullatus* Müller) makes these changes apparently necessary.

Oberholser, Harry C. *Mutanda Ornithologica* X. (Ibid. pp. 49–50) *Petrophila erythrogastra* (Vig.) becomes *P. rufiventris* (Jard. and Selby); *Iole philippensis* (Gm.) becomes *E. gularis* (Pucheran); *Erythrura tricolor* (Vieill.) becomes *E. forbesi* (Sharpe); *Spermospiza guttata* (Vieill.) becomes *S. pustulata* (Voigt.) and *Estrilda cinerea* (Vieill.) becomes *E. troglodytes* (Licht.); the names as originally proposed being in all cases homonyms.

Oberholser, H. C. A Revision of the Races of *Dendroica auduboni*. (Ohio Jour. of Science, XXI No. 7, May, 1921.)—Dr. Oberholser recognizes four races of Audubon's Warbler, dividing *auduboni* of previous writers into two forms, the more eastern of which is described as new *D. a. memorabilis* (p. 243), type from Ward, Colo. *D. a. nigrifrons* Brewster and *D. a. goldmani* Nelson are the other races, the former being restricted to the Huachuca Mts., so far as the United States is concerned, though ranging south in Mexico and the latter found only in Guatemala

Incidentally Dr. Oberholser refers to the type of *D. auduboni* as "now in the United States National Museum." As a matter of fact it is, as it

always has been in the collection of the Academy of Natural Sciences of Philadelphia as definitely stated, Proc. Acad. Nat. Sci., Phila., 1899, p. 14. The conclusions there arrived at have never been questioned and it seems rather late in the day to set up a claim that the duplicate specimen in Washington is the type and decidedly misleading to make the positive statement that it is so without even a reference to the previous type determination.

Foster, Nevin H. Birds' Songs at Hillsborough, Co. Down. (Irish Naturalist, February, 1921.)—Dates of song periods.

Wait, W. E. The Owls and Diurnal Birds of Prey. Found in Ceylon. (Spolia Zeylanica, XI, Pls. 43-44, March, 1921, pp. 317-380.)—Detailed descriptions, keys and accounts of habits.

Wait, W. E. Occurrence of *Hypolais caligata* in Ceylon. (Ibid, p. 406.)

Baker, E. C. Stuart. The Game Birds of India, Burma and Ceylon. (Jour. Bombay Nat. Hist. Soc., XXVII, No. 2.)

Baker, E. C. Stuart. Birds of the Indian Empire. (Ibid.)—A Hand List, which is most welcome in view of the proposed "Systema Avium" and the fact that it is twenty-two years since a comprehensive list of Indian birds appeared. The present instalment covers the Corvidae, Paridae, Paradoxornithidae and Turdoididae.

Donald, C. H. The Birds of Prey of the Punjab. (Ibid.) (Continued.)

Whistler, Hugh. Some Notes on the Genus *Caprimulgus* in the Punjab. (Ibid.)—A valuable paper on the occurrence and habits of the species with critical notes on their characters.

Chubb, C. On New Forms of South American Birds. (Ann. and Mag. Nat. Hist., Vol. 7, No. 38, Feb., 1921.)—*Microphila* (p. 192) is proposed as a new genus for *Sporophila castaneiventris* Cab., and *Duncanula* (p. 193) for *S. homochroa* Selater. *D. duncani* (p. 193), *Sporophila longipennis* (p. 193), *S. gutturalis roraimae* (p. 193) and *Pseudochloris roraimae* (p. 194); all from Mt. Roraima, British Guiana, are described as new.

Chisholm, A. H. Bowers and Playgrounds. (Queensland Naturalist, January, 1921.)—A plea for more study of the Bower birds.

Van Someren, V. G. L. On a Collection of Birds from Turkanaland. (Jour. E. Africa and Uganda Nat. Hist. Soc., No. 16, February, 1921.)—186 species, with list of specimens and critical notes.

Rendahl, Hjalmar. A List of the Birds of the Pearl Islands, Bay of Panama. (Arkiv. f. Zoologi, XIII, No. 4, 1920.)—Notes on one hundred species collected by Dr. C. Bovallius in 1882 for the University of Upsala.

Rochon, Duvigneaud, A. The Vision and the Eye of Birds. (Bull. Biologique de la France et Belgique, LIV, No. 2, January, 1921.)—An extended discussion of the morphology, physiology, etc., of the birds' eye. [In French].

Laubmann, A. Bird Life on the Elbea at Aitrang in Allgäu. An

Ecological Study. (Archiv f. Naturgeschichte, LXXXV. A, Heft 12, 1919, December, 1920.) [In German].

Norton, A. H. Our Stormy Petrels. (The Maine Naturalist, I, No. 1, April 25, 1921.)—An account of the habits of Leach's and Wilson's Petrels, the two occurring off the Maine coast.

Shufeldt, E. W. Young Birds and Birds Eggs. (American Forestry, April, 1921.)—Illustrated by many half-tones from photographs.

Griddle, Norman. Birds in Relation to Insect Control. (Canadian Field Naturalist, November, 1920)—A valuable and suggestive paper. In connection with the great danger attaching to systematic extermination of almost any species attention is directed to "crow shoots" so popular in recent years and largely fostered by the manufacturers of ammunition. In an agricultural area in which the crows had been nearly wiped out an outbreak of grasshoppers did great damage while in other sections crows gathered in numbers and acted as a distinct check.

Lloyd, Hoyes. The Duck Specimens Recorded as Labrador Ducks in Dalhousie College, Halifax, Nova Scotia. (Ibid.)—The female of the mounted pair proves to be our American Scoter. There are therefore only 39 specimens known to be in existence, 1 in Canada, 26 in the United States and 12 in Europe.

Wright, A. H. and S. E. R. Simpson. The Vertebrates of the Otter Lake Region, Dorset, Ontario. IV. The Birds. (Ibid.)—Annotated list of 122 species.

NOTES AND NEWS

THE DELAY of three months in the appearance of the July 'Auk' is solely due to the printers' strike, which began on May 1 and prevented the resumption of work until about August 1. Work on the October issue will proceed at once and it is hoped that it may appear before the end of that month.

When we consider the reduction in size of many scientific journals and the irregularity of their appearance during the period affected by the war, 'The Auk' feels that its readers may congratulate themselves upon having suffered no inconveniences except the delay in the appearance of this issue.

The financial burden during the past year has been a heavy one but the sale of several sets of the journal, and a most liberal contribution from the National Association of Audubon Societies, together with the generosity of Mr. S. Prentiss Baldwin, who paid for the publishing of the papers on bird banding, and of Miss Mary Wright, who bore the expense of the paper by her late brother, on the Mockingbird in New England, have enabled us to tide over what we feel has been a most critical period.

The main portion of this present issue is printed exactly as it was prepared for the press on June 1, but under 'Notes and News' we have added notes on happenings between that date and September 1.

IN THE PERIOD that has elapsed since the appearance of the April 'Auk', the Union has been severely stricken by the death of three of its Fellows, two of whom were founders and ex-presidents—a greater bereavement than has ever befallen it in any previous year of its history.

DR. J. A. ALLEN, dean of the scientific staff of the American Museum of Natural History, died at Cornwall on Hudson, New York, on August 29, 1921, after a brief illness, aged 83.

To such an extent is the present prosperity of the American Ornithologists' Union and the high standard of its official organ 'The Auk', due to the tireless energy and continued interest of Dr. Allen for almost forty years that he might justly be termed the father of our society. As a founder of the Union, its president for the first seven years of its existence, editor of 'The Auk' for twenty-eight years and of the eight volumes of its predecessor the 'Bulletin' of the Nuttall Ornithological Club, as well as of the three editions of the 'A. O. U. Check-List,' he has been active in every phase of the work of the society. Ever solicitous for the welfare of the organization he unselfishly gave to it the best that was in him. To the American Ornithologists' Union the death of Dr. Allen is a calamity.

We realize to the utmost the loss that we have sustained of a guide and counsellor, and of a kindly, sympathetic colleague in the science to which we are devoted, but in addition the death of Dr. Allen brings forcibly to our attention the passing of the older generation of American ornithologists and the shifting of the burdens of the Union upon new shoulders and ere long those of us who are now active in its affairs will have gained a measure of distinction from having had the privilege of knowing, collaborating with and loving those men to whom American Ornithology owes so much.

Joel Asaph Allen was born in Springfield, Massachusetts, July 19, 1838, the eldest son of Joel and Harriet (Trumbull) Allen, both of early New England stock. His father was a farmer and his early life was spent on the farm under rigid puritanical discipline. He attended the local district school and later spent five years at the Wilbraham Academy. At the age of thirteen he had developed an interest in nature and soon began the accumulation of specimens in such spare moments as he had, his main attention being given to birds.

In 1862 he became a special student under Louis Agassiz and accompanied him on his famous expedition to Brazil in 1865. At about the same time he was placed in charge of the department of mammals and birds in the Museum of Comparative Zoology, and in 1871 was designated assistant in Ornithology, a position which he retained until called to the Curatorship of Birds and Mammals at the American Museum of Natural History, in 1885, where the remainder of his life was spent. For some years he was in charge of all the vertebrates in the latter institution, and temporarily of the invertebrates as well, but he was eventually relieved of all responsibility except the curatorship of Mammals, to the study of which his last years were devoted.

In 1867 Dr. Allen made a collecting trip to the Middle West and in the following year to East Florida, while in 1871-2 he visited the Great Plains and the Rocky Mountains and in 1877 was a member of the U. S. Government expedition to the Yellowstone. His experiences in the then wild countries of the West and South, are set forth in his 'Autobiographical Notes' published by the Museum in 1916, and are replete with interesting description and adventure.

Dr. Allen was not only the editor of the 'Nuttall Bulletin' and 'The Auk', but also of 22 volumes of the 'Bulletin of the American Museum of Natural History' and several of the Memoirs of the same institution, and all bear evidence of his exceptional qualifications as an editor. While some of his early papers in the 'American Naturalist', descriptive of his travels in the West were of a popular character, Dr. Allen was distinctly a technical writer and all of his later publications were of a technical character. He never appeared on the lecture platform and a natural diffidence made the delivery of communications before even scientific societies difficult and distasteful.

His writings were voluminous and number upwards of 1450 titles, dealing mainly with birds and mammals, but covering reptiles; evolution, nomenclature and biography as well.

One of his earliest papers on the 'Mammals and Winter Birds of East Florida' won the Humboldt scholarship and has become a classic, setting forth as it does the general principles of the geographic distribution of birds in Eastern North America. His monographs of the North American Rodentia in association with the late Dr. Coues form another notable series of papers, while his report on the Brazilian birds brought back by the H. H. Smith Expedition ranks among the most important contributions to neotropical ornithology. Of his more important later works are his monograph of the Musk Oxen and his Mammals of the Princeton Patagonian Expedition.

Dr. Allen was always deeply interested in the problems of nomenclature and the efforts to stabilize our scientific names and the admirable style and character of our A. O. U. 'Check List' and the system of supplements are to a large extent due to him, while his interest in the general subject won him a place on the International Commission on Zoological Nomenclature.

Dr. Allen was a member of the National Academy of Science and an honorary member of a number of societies both at home and abroad.

A memorial biographical address on Dr. Allen will be delivered at the coming meeting of the A. O. U. by his former assistant and associate, Dr. Frank M. Chapman.—W. S.

CHARLES BARNEY CORY, a founder and seventh president of the American Ornithologists' Union, and Curator of Birds in the Field Museum of Natural History in Chicago, died on July 29, 1921, in the 65th year of his age.

He was born in Boston, Massachusetts, on January 31, 1857, son of Barney and Eliza A. B. Cory and was educated in Boston Schools and the Lawrence Scientific School of Harvard University. He became active in financial and business affairs in Boston, and was a director in many corporations, etc.

Later he removed to Chicago where he became curator of birds in the Field Museum of Natural History, a position which he continued to hold until the time of his death.

Mr. Cory early developed a deep interest in ornithology and formed important collections. He specialized in the birds of the West Indies and published several catalogues of this avifauna as a whole, as well as works on 'The Birds of Haiti and San Domingo' and 'The Birds of the Bahamas.' He also spent much time in Florida when the country was wilder than it is today and a little volume on 'Hunting and Fishing in Florida' describes his experiences and the fauna as he found it at that time. He established a museum at Miami, which was unfortunately

destroyed by fire. In 1894 Mr. Cory's collection was purchased by the Field Museum where he later became curator. Here he prepared a work on the 'Birds of Illinois and Wisconsin' and a new edition of his 'Key to the Birds of Eastern North America,' both intended to aid the beginner in identifying birds and to this end abundantly supplied with text illustrations.

Following the accession of considerable South American material at the museum Mr. Cory became deeply interested in the Neotropical avifauna and began the preparation of a list of the 'Birds of the Americas' supposed to contain all the species of the New World. Only two parts of this most valuable work have appeared, but we understand that Mr. Cory has left much manuscript for the succeeding volumes.

Mr. Cory was interested in other things besides ornithology—music, and various games, notably golf. In everything that he undertook he made every endeavor to excel and all of his publications are marked by sincere effort and painstaking care. His knowledge of the West Indian and South American avifauna was notable and in the course of his studies he described a large number of new species.

Mr. Cory was, before he went to Chicago, a regular attendant at the meetings of the Union and always interested in its prosperity. He was one of the Founders and served as Councillor, Treasurer, Vice President, and President.

A memorial to be presented at the next meeting of the Union will be prepared by his associate, Dr. W. H. Osgood.—W. S.

WILLIAM PALMER, a Fellow of the American Ornithologists' Union, died at Bellevue Hospital, New York, after a brief illness on April 8, 1921. He was born in Penge, a civil parish of London, England, Aug. 1, 1856, and was the son of Joseph Palmer, who later was employed for many years in the department of taxidermy in the U. S. National Museum. He came to America at an early age with his parents and received his education in the public schools. In 1874, when 18 years old, he was appointed to a position in the Museum and after some years became Chief Taxidermist and Zoological Modeler. In 1888 he was elected an Associate of the Union and ten years later a Fellow.

Palmer was a good field naturalist, a keen and careful observer, and probably more intimately acquainted with the local distribution of birds and ferns of the District of Columbia than any other naturalist of the National Capital. His early papers comprised chiefly notes on the occurrence of some of the rarer species about the district. During his connection with the Museum he made several extended field trips among the more important of which were those to the Gulf of St. Lawrence in 1887, to the Pribilof Islands in Bering Sea in 1900, and to Java about ten years ago. The trip in 1887 was made on the U. S. Fish Commission Schooner 'Grampus' for the purpose of collecting specimens and notes on

the various fish-eating birds. During the cruise he visited the Magdalen Islands and Bird Rock in the Gulf of St. Lawrence, Funk Island, and several points in Newfoundland and southern Labrador. A paper on the birds which he observed appeared in the 'Proceedings' of the U.S. National Museum for 1890, pp. 249-265. His most important ornithological publication was probably his report on the 'Avifauna of the Pribilof Islands' issued in 1899 as a chapter in part 3 of the Jordan Commission Report on 'The Fur Seals and Fur Seal Islands of the North Pacific Ocean.' In this report he summarised all the information then available regarding the birds of the islands and incorporated some valuable notes on the development of plumage based on his own observations. Unfortunately he never published any general report on his work in Java.

He was greatly interested in feather development and at the Washington meeting of the Union in 1898 he presented an original and important paper on 'Some Characteristics of Neosoptiles.' Part of his conclusions were included in his Pribilof report but the details of this work were never published in full. He was always loath to publish before he had exhausted his subject and because of the high standard of completeness which he set for himself much of his material never appeared in print and consequently the public has been deprived of the benefit of many of his valuable observations.

In addition to birds he devoted much attention to ferns and was an authority on the ferns of Virginia and the District of Columbia. In recent years he had become much interested in the vertebrate fossils of the miocene beds of the Calvert Cliffs, Maryland, and collected much material representing the whales, dolphins, sharks, and other marine forms found in this deposit. In short, William Palmer was an all round naturalist, a careful and accurate observer, a skillful taxidermist, and possessed an excellent knowledge of the groups in which he was interested. Beside his affiliation with the A. O. U. he was a member of the American Fern Society, serving as president in 1917 and 1918, and was an officer of the Biological Society of Washington, and for several years filled the position of chairman of the Committee on Communications.

In accordance with the custom of the Union, after the death of a Fellow a formal memorial address on his work is presented at the next meeting. This address will be prepared by Dr. Charles W. Richmond and will be published in 'The Auk.'—T. S. P.

JOHN LEWIS CHILDS, an Associate of the Union from 1900 to 1906, died Mar. 5, 1921, en route from Albany to New York City while returning from California to his home in Floral Park, N. Y. He was born in Jay, Maine, May 13, 1856, and received his education in the public schools of that town. At the age of 18 he began his life work in floriculture at East Hinsdale, Long Island, and a few years later he purchased a tract of land nearby which is now in the village of Floral Park. Within 15 years

from the time he started in business his name became widely known in this country and abroad through his horticultural publication the 'May-flower', which had a circulation of half a million copies, and through his catalogues which were circulated in enormous editions.

Mr. Childs was active in public affairs both local and state. He served as the first president of the village of Floral Park, was a member of the State Senate of New York in 1894 and 1895, and was twice defeated for Congress on the Republican ticket. He served for many years as president of the Board of Control of the State Normal and Training School at Jamaica, 20 years as president of the Board of Education of Floral Park, and at the time of his death was a member of the Advisory Board of the Orphan Asylum Society of Brooklyn, N. Y.

About 1895 he became interested in ornithology and especially oölogy and brought together what was said to be one of the finest private collections of birds' eggs in this country, containing representatives of nearly all the species in the A. O. U. 'Check List'. A catalogue of his collection of birds, nests, and eggs was published in 1906 and a few years later a catalogue of his ornithological library. Mr. Childs contributed a few notes on birds to 'The Auk' during the years 1900 and 1908, but his principal articles appeared in 'The Warbler'. This periodical he published in two series, the first comprising two volumes issued in 1903 and 1904, and the second seven volumes 1905-1913 (vol. VI, 1910, and VII, 1913). It is much to be desired that ultimately his collection of eggs may be acquired by some public museum where its treasures will be generally accessible to oölogists. Biographical sketches of Mr. Childs may be found in 'The Condor', vol. IX, for Sept., 1907, and in 'The Oologist', vol. XXXVIII, for April and August, 1921, the first and last illustrated by portraits.—T. S. P.

SERGIUS NIKOLAEVICH ALPHERAKY, 1850-1918, of Petrograd, Russia, a Corresponding Fellow of the Union since 1913, died in 1918 at the age of 68, but news of his death has only recently reached the United States. Alpheraky was primarily an entomologist and beginning in 1884 published a number of papers on insects chiefly on Lepidoptera. His principal ornithological works are those on the waterfowl of Russia, comprising a monograph on the ducks, 'Utki Rossii', and a companion work on Geese, 'Guai Rossii'. The latter containing descriptions of practically all the Palearctic species appeared in 1904. In the following year it was translated into English by John Marshall of Trinity College, Cambridge, England, under the title of 'The Geese of Europe and Asia' and was illustrated by a frontispiece by Suschkin and 24 colored plates by Frohawk. This important monograph (which was reviewed in 'The Auk' for April 1907, pp. 229-230,) is the work by which its author is chiefly known to English readers. Alpheraky was a corresponding member of the Imperial Academy of Sciences at Petrograd, a member of the Imperial Russian Geographical Society, and an honorary member of the Russian Entomological Society.—T. S. P.

COL. HENRY WEMYSS FEILDEN, a Corresponding Fellow of the Union since 1884, died at his home in Burwash, Sussex, England, on June 18, 1921. He was the second son of Sir William Feilden, second baronet of Fernisowles, Lancashire, and was born in October, 1838. His early education was received at Cheltenham and Sandhurst and at the age of 19 he began his army career in India. For his service in the Indian Mutiny in 1857-58 he received a medal and clasp and similar recognition for service in China in 1860. In 1862 he joined the Confederate Army with the rank of Asst. Adjutant General and at the close of the war in 1865 he surrendered with the army of Tennessee under Gen. J. E. Johnston. Later he was called to South Africa during the Boer trouble in 1881 and in the summer of 1888 he was stationed in Barbadoes.

While serving in the Confederate Army in 1864 he married the daughter of David MacCord of South Carolina and after the close of the Civil War returned to England to recuperate and enjoy a much needed rest. In 1872 he made a six weeks' trip to the Faroe Islands and in 1875-76 served as naturalist on H. M. S. 'Alert' on the Nares Expedition to the Arctic. During this expedition which left Upernavik, Greenland, in July, 1875, and remained in the north until October of the following year, he was able to obtain much valuable information and to secure among other things the young of the Knot (*Tringa canutus*)¹ and eggs and young of the Sanderling (*Calidris arenaria*). The results of this work appeared in a report in the 'Narrative of the Voyage' of the Alert and also in special papers. His interest in the Arctic aroused by his service on the Alert never abated and subsequently at various times he visited Spitsbergen, Voigach, Russian Lapland, Kolgnev, and Nova Zembla. An account of his trip to Spitsbergen appeared in the 'Zoologist' for 1895 and the details of a trip to Arctic Russia may be found in Henry J. Pearson's 'Beyond Petebora Eastward', 1899.

Col. Feilden was a warm friend of Harvie Brown and between them they brought together a notable collection of birds and eggs most of which unfortunately were lost in the fire which destroyed Harvie Brown's mansion at Dumfries, Scotland, in January, 1897.

Col. Feilden published a number of papers but no complete list of them has yet been issued. After the death of his wife, which occurred in 1914, he became much depressed and was ailing for some time prior to his death. An interesting sketch of his life from which the above facts have been gleaned, appeared in the London 'Field' for July 2, 1921, p. 33.—T. S. P.

FREDERICK HERSCHEL WATERHOUSE, a Corresponding Fellow of the Union since 1889, died in London, England, Mar. 12, 1919. He was

¹ For a note on the later discovery of egg of this species by Lieut. A. W. Greeley, see Merriam 'Auk' II p. 312, 1885.

born Oct. 4, 1845, and at the time of his death was in his 74th year. He was best known as Librarian of the Zoological Society of London, a position which he filled from Feb. 1, 1872, until his retirement on Jan. 1, 1913. During this time he brought out the fourth and fifth editions of the 'Catalogue of the Library of the Zoological Society' in 1887 and 1902 and published several other valuable works of reference. Among the most important of these were his 'Dates of the Works of John Gould', 1885, and his 'Index Generum Avium', 1889—the latter a most useful list containing references to the place of publication of about 7000 generic names of birds. This Index has been critically examined by Richmond, who has published from time to time three lists of additional names including those omitted as well as those proposed from 1889 to 1915 and has added a useful list of corrections (Proc. U. S. Nat. Mus., vol. 53, pp. 565-573, 1917), which should be consulted by those who have occasion to look up avian generic names. A companion index of generic names of mammals was projected by Waterhouse and was well under way when upon learning that a similar work was being prepared by the U. S. Dept. of Agriculture he generously consented to the acquisition of his manuscript by the Department and the additional material was incorporated in Palmer's 'Index Generum Mammalium' issued in 1904. In his earlier years Waterhouse was interested in insects and published in the Journal of the Linnaean Society of London (Zool.) for 1878, a paper containing 'Descriptions of New Coleoptera of geographical interest collected by Charles Darwin.' As librarian he was able to contribute in various ways to scientific work and it is much to be desired that others in such positions would utilize their opportunities in making similar contributions. A brief account of his work may be found in 'The Entomologists' Monthly Magazine', vol. LVI, p. 17, 1920.—T. S. P.

DR. VALENTIN LVOVICH BIANCHI of Petrograd, Russia, a corresponding Fellow of the Union since 1916, died on Jan. 10, 1920. He was born in 1857. For a number of years prior to his death he had been connected with the Zoological Staff of the Museum of the Imperial Academy of Sciences at Petrograd, where he was curator of the ornithological department. He was also active in entomology and many of his earlier papers were devoted to this subject. Among others was an 'Enumeration of the Works on Hemiptera-Heteroptera of the Russian Empire' during the century from 1798 to 1897 which appeared in 1898. He published a number of papers on ornithology, one of the earliest of which appeared in 1886 under the title 'Zur Ornithologie der westlichen Ausläufer des Pamir und des Altai' and contained notes on 136 species of birds from the region east of Bokhara. This was followed in 1890 by 'Notes on the Birds observed in the summer of 1894 near Ushaki in the government of Novgorod.' Among his papers containing revisions of groups may be mentioned his review of the palaearctic species of *Carpodacus*, 1897, and *Tetraogallus*, 1899.

He kept up his activities as far as possible to the end but was unable to publish anything during the last three years of his life. He left a number of valuable ornithological manuscripts which together with his publications are in the possession of his son Leo Bianchi, librarian of the Zoological Museum of the Russian Academy of Sciences, Petrograd.—T. S. P.

The announcement that the Brewster Memorial Medal will be awarded for the first time in 1921 recalls the fact that several medals have been provided in recognition of special work in ornithology. The Daniel Giraud Elliot medal of the National Academy of Sciences has been awarded three times for ornithological work—in 1918 to Frank M. Chapman for his report on the 'Birds of Colombia', in 1919 to C. William Beebe for his 'Monogrape of the Pheasants', and in 1920 to Robert Ridgway for his 'Birds of North and Middle America.' This medal will be awarded again this year and possibly also the Salvin Godman Medal of the B. O. U. which has not thus far been awarded.

DR. ALEXANDER WETMORE, of the Biological Survey, returned in May after an absence of twelve months from a successful trip to Argentina, Paraguay, Uruguay, and Chile. One of the main objects of his trip was to secure data on the occurrence of North American migrants in the southern part of South America.

R. N. DAVIS, Director of the Everhart Museum in Scranton, Pa. has recently returned from a successful trip to Panama where he secured an interesting series of specimens representing many species of birds.

H. S. SWARTH, with his assistant W. D. Strong, has recently resumed field work in British Columbia begun two years ago. The work this year will be done in the Skeena River district and will continue five months.

PROF. WILLIAM ALANSON BRYAN, formerly connected with the Bishop Museum in Honolulu, has been appointed Director of the Los Angeles Museum of History, Arts and Sciences.

ARETAS A. SAUNDERS has spent the summer studying the bird-life of the Alleghany (N. Y.) State Park, in Cattaraugus Co., N. Y., close to the Pennsylvania line. The study was made under the direction of Dr. C. C. Adams of the Roosevelt Wild Life Forest Experiment Station, N. Y. State College of Forestry.

DR. CLARA BARRUS, literary executor and authoritative biographer of the late John Burroughs, asks that all persons owning interesting letters

from Mr. Burroughs will communicate with her at Woodchuck Lodge, Roxbury, N. Y. All letters sent will be promptly copied, or extracted from, and returned to the owners.

DR. ANTON REICHENOW, for many years curator of birds in the Berlin Museum, has retired and has been succeeded by Dr. Erwin Stresemann.

THE POLISH NATIONAL MUSEUM OF NATURAL HISTORY has been formed by a union of the Branicki Zoological Museum and the Zoological Museum of the University of Warsaw. The keeper of the ornithological section, T. Chrostowski, whose address is Kraskowskie-Przedmiescie 26-28, Warsaw, is particularly interested in Neotropical ornithology and is author of a paper on the types of Neotropical birds in the Zoological Museum at Petrograd.

NEWS has recently been received from Petrograd that Prof. Sergius A Buturlin is reported to be living in Alaty, near Kazan in Eastern Russia, and Prof. Michael A. Menzbier is still in Moscow.

PREPARATIONS for the Ten Years' Index of 'The Auk' for 1911 to 1920 are now under way. The committee was organized at a meeting held on May 20 and the work distributed among the members. The plan of this Index will be the same as that of the last and it is hoped to have the work well advanced before the next annual meeting of the Union.

A NEW JOURNAL, 'The Maine Naturalist', appeared on April 25, 1921, with the sub-title of 'Journal of the Knox Academy of Arts and Sciences,' at Thomaston, Maine. Norman W Lermond is the Managing Editor and with Arthur H. Norton and Alfred O. Gross in charge of the department of Ornithology, bird notes are assured a prominent place and Maine ornithologists will once more have a medium for the publication of local records. The first issue is a very creditable one. It will appear as a semi-annual in April and October.

OWING to an oversight the date of the annual stated meeting of the American Ornithologists' Union was wrongly given in the April 'Auk'. The meeting will convene for its business session at the Academy of Natural Sciences in Philadelphia on Monday, November 7, followed by the general meeting for the presentation of papers on November 8, 9, and 10. On Friday, November 11, a visit will be paid to the gardens of the Zoological Society, where the bird collection is particularly fine, and on Saturday a trip is planned to an attractive camp in the New Jersey pine barrens. We would again urge all members to plan to be present on this occasion and to send to the Secretary as soon as possible the titles

of their papers, so that a program may be prepared in advance. This has long been a desideratum and can only be accomplished by the co-operation of the speakers. Any additional information desired will be furnished by addressing the local committee at the Academy of Natural Sciences, Logan Circle, Philadelphia.

THE AUK

A Quarterly Journal of Ornithology

ORGAN OF THE AMERICAN ORNITHOLOGISTS' UNION

Edited by Dr. Witmer Stone

ACADEMY OF NATURAL SCIENCES, LOGAN CIRCLE,
PHILADELPHIA, PA.

To whom all articles and communications intended for publication and all books and publications for review should be sent.

Manuscripts for leading articles must await their turn for publication if others are already on file, but they must be in the editor's hands at least six weeks before the date of issue of the number for which they are intended, and manuscripts for 'General Notes,' 'Recent Literature,' etc., not later than the first of the month preceding the date of issue of the number in which it is desired they shall appear.

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THE OFFICE OF PUBLICATION

8 WEST KING STREET, LANCASTER, PA.

Subscriptions may also be sent to the Editor, ACADEMY OF NATURAL SCIENCES, Logan Circle, Philadelphia. Foreign Subscribers may secure 'The Auk' through Witherby & Co., 326 High Holborn, London, W. C.

Subscription, \$4.00 a year. Single numbers, one dollar.

Free to Honorary Fellows, and to Fellows, Members, and Associates of the A. O. U., not in arrears for dues.

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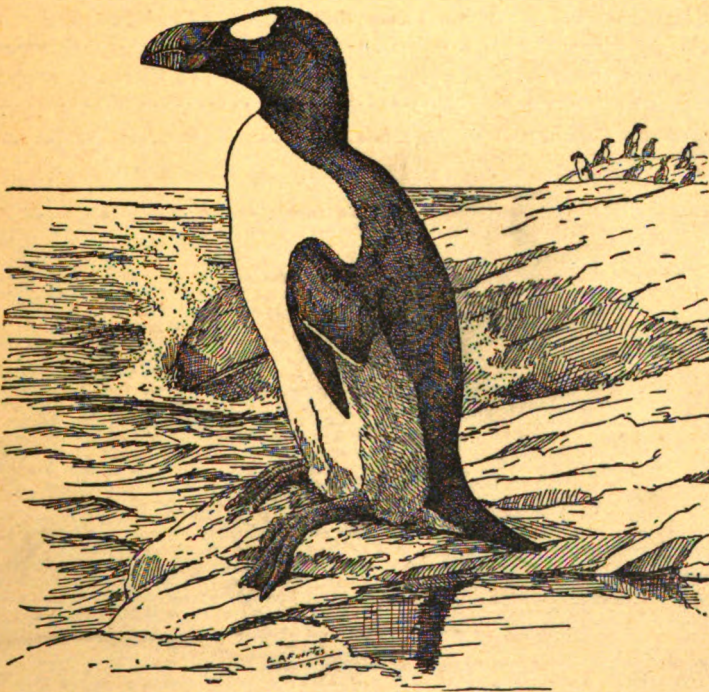
The Auk

A Quarterly Journal of Ornithology

Vol. XXXVIII

OCTOBER, 1921

No. 4



PUBLISHED BY

The American Ornithologists' Union

LANCASTER, PA.

ISSUED DECEMBER 1921

Entered as second-class mail matter in the Post Office at Lancaster, Pa.

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IN MEMORIAM: WILLIAM DUTCHER.

BORN JANUARY 20, 1846—DIED JULY 1, 1920.

Plate XV

BY T. S. PALMER.

STANDING in the heart of the business district of lower New York, within a stone's throw of Wall Street and old Trinity Church, is a building of a dozen or more stories, formerly considered a tall structure but now overshadowed and almost shut in by neighboring skyscrapers. To the casual observer there is little to distinguish this building, at 141 Broadway, from others in the neighborhood and it seems a most unlikely place for effective work in ornithology, but to one familiar with the circumstances the spot recalls associations and events of far reaching interest and importance. Here on one of the upper floors overlooking Broadway was the private office of William Dutcher, Ornithologist, Bird Lover and Conservationist. This was the scene of his labors during the years of his greatest activity and here he set in motion various projects which made a profound impression on the protection of bird life in distant parts of the country and resulted in the erection of an imperishable monument to his name.

William Dutcher was the son of Rev. Jacob Conklin Dutcher,

a Dutch Reformed minister, and Margaretta Ayres, of New Brunswick, N. J. On his father's side he was a direct descendant of Captain William Dutcher of revolutionary fame, and of Isaac Van Wart, one of the captors of Major André; and on his mother's side, of Edward Fuller, one of the Mayflower pilgrims. He was born at Stelton, N. J., January 20, 1846, while his father was still a theological student at Rutgers College. After a few months his father moved to Coxsackie, N. Y., where he had a parish and about two years later again moved to Owasco, southeast of Auburn, N. Y. William's early education was secured in the local schools, but at the age of thirteen circumstances having made it necessary for him to engage in some occupation, he entered the office of a banker named Wright at 13 Bond Street, New York City, and while there employed lived with Mr. Wright and became a member of his family. A few years later, when his health was threatened, through the confinement of the office, he worked for some time on a farm near Springfield, Massachusetts.

Dutcher's career may be conveniently divided into decades. The first and second included his boyhood and early experience in business life, the third marked his entry into the insurance business in New York, and the following three decades from 1879 to 1910 were the years of his ornithological activity while the last decade of his life was passed in retirement.

Returning to New York City about the age of twenty he became connected with the Brooklyn Life Insurance Company and entered on a business career in life insurance which was destined to continue for many years. Entering the office first as clerk he was later promoted to the position of cashier and finally secretary. He remained with this company until the winter of 1894-95, when he became associated with the Prudential Insurance Company of New Jersey, with which he remained until his retirement from active business.

On May 18, 1870, at the age of twenty-four, Mr. Dutcher was married to Miss Catharine Oliver Price of Elizabeth, N. J., and took up his residence at Bergen Point, in that State. Here his son, Basil was born December 3, 1871. In 1876 he moved to New York, residing at 27 West 18th Street, afterwards occupied by the

store of Siegel-Cooper & Co., and five years later moved to 128th Street. In the spring of 1889 he moved again, this time to 525 Manhattan Avenue, a number well-known to all the early members of the Union, as it was here that the Treasurer had his office and the council usually held its meetings when the Union met in New York.

While living in New York, Mr. Dutcher was accustomed to find his recreation in hunting, chiefly along the shores of Long Island and New Jersey, where during the open seasons his holidays were spent in search of game birds—snipe and ducks in the autumn, and geese in March. On May 28, 1879, while hunting on the shores of Shinnecock Bay near Good Ground, Long Island, he shot a bird which was new to him and which proved to be a female Wilson's Plover (*Ochthodromus wilsonius*). This bird, mounted by John Bell, the veteran taxidermist of New York, became number one in the Dutcher collection of Long Island birds and was duly recorded in a brief note in the October number of the 'Bulletin of the Nuttall Ornithological Club' for 1879. The seemingly unimportant incident of the capture of this specimen and the publication of this brief note marked the turning point in Dutcher's career and proved the opening of a new chapter in his life. From this time on his interest in birds developed along new lines and he hunted not merely for recreation and amusement but to add to his knowledge of bird life and to acquire information which would aid in the prosecution of his scientific studies.

Finding that his time was limited he resolved to confine his attention to the birds of Long Island and soon became deeply interested in collecting all available information regarding the species of this region. His collection grew apace and was increased by the addition of specimens from various sources. At the same time he carefully and systematically collected every record and bit of information which would throw light on the precise distribution, occurrence and habits of Long Island birds. For about fifteen years he devoted unremitting attention to accumulating material both in the form of specimens and notes which would be useful in the preparation of a comprehensive work on the birds of Long Island. He examined the specimens

in the collection of the Brooklyn Institute, and the American Museum, and in various local collections. He secured notes and records from sportsmen, market hunters, and baymen, and in short left no stone unturned in bringing together facts of interest regarding the various species.

Shortly after the organization of the Linnaean Society of New York he became a member and met George N. Lawrence, the veteran ornithologist, and others who were active at that time. Upon the founding of the American Ornithologists' Union in September, 1883, Dutcher was elected an associate member and in the following year was appointed on the committee on Protection of North American Birds. The active work of this work mittee really began at a meeting held in his office at 51 Liberty Street, New York City, in December, 1885. The chairman of the committee was the late George B. Sennett and among the most active members were Dr. George Bird Grinnell, then editor of 'Forest and Stream,' and William Dutcher. The original minutes of the meetings of this committee, entered in a book which is now in the possession of the National Association of Audubon Societies, show in detail the work accomplished during the three years that the committee was active. The most important results included the organization of the original Audubon Society with a large membership and the drafting of a model law, for the protection of non-game birds subsequently known as the A. O. U. or Audubon law.

In 1886, at the first Washington meeting of the Union, Mr. Dutcher was elected an active member and this event marked the beginning of his association with certain activities at the National Capital. It was here at a subsequent meeting of the Union that he exhibited with considerable pride the results of his first experiments in photographing birds. It was here that he later paved the way for the inclusion of nongame species in the Federal law for the protection of migratory birds and it was here finally that he took up his last residence shortly before his death.

In 1887 he was elected Treasurer of the Union, an office for which he was peculiarly well adapted and which he filled with

remarkable success for a period of sixteen years. Singularly systematic in all his work and prompt in business dealings, he had little patience with failure to act promptly in business matters. So successful was he in collecting dues that a year or two after his appointment he was able to report at the annual meeting that 90 per cent. of the entire membership was fully paid up to date, a record which has perhaps not since been surpassed.

During the early nineties, about the time of Dr. Parkhurst's activities and the investigation of the Lexow Committee, Mr. Dutcher became active in civic affairs. Deeply interested in the movement for the improvement of conditions in New York City, he became identified with good government clubs, took an active part in elections, served on several occasions as inspector or judge of elections, and became thoroughly familiar with the records of various candidates for local offices. On one occasion he was urged to become a candidate for alderman but for various reasons declined to enter the race. His experience in civic affairs laid the foundation for much of his subsequent work and made a deeper impression on his later activities than was apparent at first sight. Under the head of what he was accustomed to call "civics" Mr. Dutcher included certain public activities which he considered a part of the personal and public duties of every good citizen and which he took as seriously as he did his business or any other matters in which he was particularly interested. During all his active career he never failed to familiarize himself with the records and characteristics of the principal local and state candidates for office, and to a certain extent of those in the field of national politics. Doubtless the experience gained at this time enabled him in later years so successfully and effectively to handle legislative matters when he took up practical work in behalf of bird protection.

In 1896 and in 1897 he served as chairman of the committee on Protection of Birds of the American Ornithologists' Union and was especially active in urging the formation of State Audubon societies. These years of preliminary preparation proved to be merely an introduction to his most important life-work.

The opening year of the new century marked the beginning of

the most active period in his career and of his work in bird protection. In December, 1899, Abbott H. Thayer, the artist, wrote to Dr. Stone, then chairman of the A. O. U. Committee, relative to raising a fund for the protection of the colonies of sea birds along the Atlantic Coast. Mr. Dutcher was induced to take charge of this phase of the Committee's work and at once entered into correspondence with Mr. Thayer. In a letter dated January 25, 1900, the latter inclosed \$110 as a contribution "toward our fund" and in the weeks which followed added substantial contributions. It happened that at this time Mr. Dutcher was particularly interested in a bill then pending in the New York legislature for the protection of gulls and terns, and he saw the possibilities in this fund for helping his work in the Legislature and in providing the payment of wardens to protect the gull colonies. By April work had progressed to a point where the fund warranted active field work, but operations were handicapped by lack of information as to actual location of the most important breeding grounds and the protection accorded the birds under State laws. Nevertheless wardens were employed and a beginning made in what proved to be the first practical work in America in protecting sea birds.

It should be recalled that at this time there was pending in Congress a measure of far reaching importance, commonly known as the Lacey Act. This bill which had been under consideration for nearly three years was finally passed by the House on April 18, 1900, three weeks later by the Senate, and on May 25, it became a law. During the closing weeks of this legislation Mr. Dutcher took an active part in assisting in the passage of the Act, notwithstanding his activities in organizing a warden force and in keeping in touch with legislation at Albany.

At the next annual meeting of the Union held in Cambridge, Mass., in the following November, he presented a detailed and very interesting report of the activities of his committee along the coast from Maine to Virginia. Experience had shown that the work was hampered by lack of adequate laws by which the birds could be given protection even when under the care of regular wardens. With the beginning of 1901, a year in which the

legislatures of most of the States were in session, Mr. Dutcher laid out an elaborate campaign for better bird legislation. The latter part of January found him at Augusta, Maine, urging in person before a joint committee of the House and Senate the necessity for proper protection of gulls and terns on the Maine coast. Later at Trenton, N. J., Albany, N. Y., and Hartford, Conn., he had bills introduced including the provisions identical with or closely modeled after the A. O. U. law. In Massachusetts through other members of the committee similar legislation was introduced, while in Delaware after a hot campaign he finally succeeded in securing the enactment of a comprehensive bird law. Later in the spring when the legislature of Florida convened he journeyed to Tallahassee and spent ten days in an effort to convince the members of the importance of bird protection. So successful was he in these various directions that at the close of the year he had the satisfaction of reporting that the model law had been enacted in seven of the States and for the first time it was possible to provide adequate protection for gulls and terns at the most important breeding colonies along the coast. Shortly after the enactment of the Florida statute attention was called to the important colony of Brown Pelicans which had nested for many years on Pelican Island in the Halifax River near Sebastian, Fla., and which on various occasions had been subjected to ruthless slaughter. Several times the nests had been robbed to such an extent that the future of the colony was threatened. It seemed desirable that title should be acquired, if possible, to the small island on which the birds nested, but as the island was still unsurveyed public land it could not be purchased until it had been surveyed and the plat approved by the General Land Office. Mr. Dutcher thereupon arranged to have the island surveyed but to his dismay learned that on approval of the survey the land would be open to entry by anyone and he might finally fail to secure possession. At this juncture a suggestion was made by the Surveyor General of the General Land Office that the island should be made a National Reservation by Executive Order. Mr. Dutcher at once adopted the suggestion with enthusiasm and upon his recommendation, made through the

United States Department of Agriculture, Pelican Island was reserved by President Roosevelt on March 14, 1903, as a preserve and breeding ground for native birds and thus became the first National Bird Reservation.

Two years previous the first steps toward the foundation of the National Association of Audubon Societies had been taken at the annual meeting of the Union in Cambridge in November, 1901, through the organization of a National Committee made up of representatives of the various State societies. Mr. Dutcher was elected chairman of this committee and the work began to grow apace. Among those who became interested in the new organization at an early date was Albert Wilcox, a cotton broker of New York and New Orleans, who after meeting Mr. Dutcher and looking into the plans for work urged the appointment of an active secretary who could devote considerable time to building up the membership and extending the influence of the association. He also suggested the incorporation of the association. Acting on these suggestions Mr. T. Gilbert Pearson was appointed secretary and in January, 1905, the new organization was incorporated as the National Association of Audubon Societies and Mr. Dutcher was elected president. The wisdom of the selection of these two officers was amply justified by the success of their work. In the following year Mr. Wilcox died suddenly and it was then discovered that he had endowed the Association handsomely, and having made it one of the residuary legatees under his will, the Association received an endowment of \$331,072. This bequest immediately assured the permanency of the Association and its work of education and conservation.

The year 1907 was a busy one both in legislation and in extension of the work of the Association, but a sad one for Mr. Dutcher on account of the impairment of the health of his daughter, Mary, who had contracted tuberculosis. In the hope that a change would benefit her health, he decided in 1908 to move from New York to Plainfield, N. J. This hope proved in vain and within a few months he was called upon to meet one of the greatest sorrows of his life in the death of his daughter on January 17, 1909. How much this loss meant to him and how much it affected

his career is known to but few outside the immediate family circle.

The year 1910 may fairly be considered as the culmination of Mt. Dutcher's career. The outstanding project of the spring was the introduction in the New York legislature of the Shea-White bill prohibiting the sale of aigrettes. Active work in behalf of the bill at Albany was entrusted to Mr. Pearson, while Mr. Dutcher remained at his office in New York skilfully directing affairs and bringing every pressure to bear in behalf of the measure. So successful were the efforts of the friends of the measure that the bill finally passed and was approved by Governor Hughes on May 7, thus for the first time providing adequate means of restricting the traffic in aigrettes for millinery purposes. No sooner was the success of the measure assured than Mr. Dutcher sailed for Europe as the representative of the National Association at the Fifth International Congress of Ornithology which convened in Berlin on May 30. Here he extended an invitation to the Congress to hold its next meeting in the United States, presented a paper on International Bird Protection, and received an appointment on the International Committee for the Protection of Birds. Upon his return to New York early in the summer he was welcomed by a number of his friends who had arranged a luncheon in his honor on July 14 and presented as a testimonial of their regard for his success in bird protection a fund of about \$7500 to be known as the Mary Dutcher Memorial Fund. Two months later, in September, occurred the annual meeting of the American Fisheries Society at the New York Aquarium which Mr. Dutcher attended and discussed with various members matters of conservation of mutual interest.

On October 19, only six days before the annual meeting of the National Association, which was to have been a notable event in celebration of the successful work of the year, Mr. Dutcher suffered a stroke of apoplexy which paralyzed his entire right side and left him speechless so that he was unable to communicate his thoughts except by signs. Of the heroic patience with which he endured his affliction for nearly ten years it is unnecessary to speak in detail, but it is important to mention that during all

this time he never lost his interest in birds. In spite of suffering and sorrow he kept fully informed of the progress of the work, was always interested in reading about his favorite subject and whenever possible insisted on attending the annual meetings of the National Association of Audubon Societies and on one or two occasions the meetings of the Union. The last meeting of the Union at which he was present was that held in New York on the historic occasion of Armistice Day, November 11, 1918. In spite of the confusion attending the celebration he made his way in charge of his nurse to the meeting of the council and after the routine business had been disposed of he produced a package and carefully unwrapping it exhibited a copy of Giraud's 'Birds of Long Island' with a photograph of the author and two autograph letters which he had treasured for many years. After some difficulty he made known that he wished the editor of the Union to prepare a biographical sketch of Giraud and his work for publication in 'The Auk.' This article prepared in accordance with his wish by Dr. Stone appeared in 'The Auk' for October, 1919, pp. 464-472, and may fairly be considered as Dutcher's last contribution to ornithology.

In this connection reference may be made to Mr. Dutcher's ornithological publications comprising about 100 titles which naturally fall into four groups: (1) A series of notes on the birds of Long Island; (2) a few general papers on birds; (3) a series of annual reports and brief notes on bird protection chiefly in connection with his work as chairman of the Bird Protection Committee and President of the National Association of Audubon Societies; (4) about twenty or more popular leaflets on common birds prepared for elementary instruction in schools and issued as part of the series of Audubon Educational Leaflets.

The notes on Long Island birds appeared mainly in the Proceedings of the 'Linnaean Society' and in 'The Auk' and contain many records of value and of considerable local interest. Many of these notes together with unpublished material from his note books, were incorporated in Dr. Braislin's 'Birds of Long Island' 1907, and also in Eaton's 'Birds of New York' 1910-14. Among his general papers the most important were those summarizing

existing information in regard to the Labrador Duck¹ in which were brought together all the records then available and a list of the known specimens which increased the total number from 33 to 42. Later, in connection with W. L. Baily he published² an important 'Contribution to the life history of the Herring Gull (*Larus argentatus*) in the United States,' a bird in which he was greatly interested and to which he had given special attention for some years. Among the bird protection papers mention should be made of his 'History of the Audubon Movement from 1883 to 1904'³ and 'Some Reasons Why International Bird Protection is Necessary,'⁴ the latter presented before the International Congress in Berlin.

When it is realized that Dutcher's writing was nearly all done at night or in leisure hours after a busy day at the office with all the disturbances and routine details incident to an active business life, the wonder is not that he did not write more but that under the circumstances he was able to accomplish so much. Writing with him was a somewhat serious and laborious occupation. He always wrote out his papers in long hand, but the actual writing was rather a pleasure than otherwise for his handwriting was beautifully distinct and legible and he took great pride in it. His signature was remarkably clear and he always took time to give each letter its proper form. In preparing his papers his main object was a clear and accurate statement of facts and he frequently spent much time in correcting and rewriting his manuscript so that his ideas might be expressed in the precise form in which he wished them stated. This was especially so in the case of his annual reports and his educational leaflets. The subjects of his papers were usually matters of personal observation or work which he deemed important to place on record, such as notes on the occurrence or habits of certain birds or reports on his activities in bird protection. Some were more or less didactic such as his leaflets for use in bird study in the schools or the

¹ 'The Auk,' VIII, pp. 201-216. April, 1891; XI, pp. 4-12, 175-176. 1894.

² 'The Auk,' XX, pp. 417-431. Oct., 1903.

³ Bird Lore, VII, pp. 45-57. Feb., 1905.

⁴ Bird Lore, XII, pp. 169-172. 1910; Verhandlungen V. Int. Orn. Congress, pp. 858-882, Berlin, 1911.

statements for use in connection with legislative measures. His reports as chairman of a committee or president of the National Association of Audubon Societies were not mere statements of routine business, but were complete records of the work accomplished during the year with suggestions or outlines of future activities.

It will be noticed that Dutcher's most important work lay in the field of applied ornithology and especially in bird protection. It was his ambition to have the more important facts of economic ornithology and the life histories of birds put in clear and attractive form so that they would interest the general public and could be available for educational purposes. In this way he hoped to restrict the wholesale slaughter of birds for millinery purposes or for sport and to prevent the extermination of certain species which seemed doomed to follow in the wake of the Great Auk the Passenger Pigeon and the Labrador Duck. His active interest in conservation began many years before the now familiar term 'conservation' came into general use. As early as 1887 he introduced at one of the meetings of the Linnaean Society a resolution for the protection of the Yellowstone National Park so that his activities in behalf of bird protection extended over a period of more than a quarter of a century. In this field he almost always worked through some committee or organization, realizing that in this way he could command more support and make his energy count for more before the public or in legislative matters than by his own unaided efforts. It made little difference whether he served as chairman or not, as he entered into the work with vigor and enthusiasm and soon became one of the most active members of the committee.

In personal appearance Mr. Dutcher was somewhat above average height, dignified and rather serious in manner but always very approachable. He invariably commanded respect by his fairness and by his earnest manner and was able to hold the attention even of an unsympathetic audience at a legislative hearing. He made friends easily, was always glad to meet his friends and acquaintances, and was cordial even to strangers. He was particularly interested in young men and ready to aid them in

any way. Several ornithologists now well known can doubtless recall the assistance which he rendered them in the early days of their study of birds. At the meetings of the Union he made it a point to become acquainted with the younger members and many of these visiting New York were from time to time invited to his home. While rarely referring to religious matters he was in fact almost as much interested in his church work as he was in civics and for many years was a vestryman in the Episcopal Church. Quiet and unostentatious, he never missed an opportunity to extend a helping hand to any who needed it and many private deeds of charity should be placed to his credit. To one in need he spared no effort to render such assistance as he could. Wherever he went he made friends and while in his legislative work he necessarily had opponents it is doubtful if he had any actual enemies. To know William Dutcher was a privilege, to work with him was an inspiration.

1939 Biltmore St., Washington, D. C.



NOTES ON THE BIRD-LIFE OF SOUTHEASTERN TEXAS.

BY T. GILBERT PEARSON.

Plates XVI-XVII

DURING the spring of 1920 a field trip in the interests of the National Association of Audubon Societies took me into southeastern North Carolina, southern Mississippi, western Louisiana, and southeastern Texas. The region covered in Texas has been so little visited by ornithologists of recent years that it is thought the following observations concerning some of the birds found in that territory may be worth recording.

Aboard the patrol-boat "Jim Duke," owned and operated by the Texas State Game, Fish and Oyster Commission, in company with William L. and Irene Finley, I cruised the various bays from Aransas Pass northward to Caranchua Bay, an offshoot of

Matagorda Bay, north of Port Lavaca. By means of launches and a sailing vessel I also investigated much of the waters of Corpus Christi Bay and Laguna de la Madre, going as far south as the southern end of Padre Island. The entire distance covered was in the neighborhood of two hundred miles. Some time also was spent in field observations at various places on the mainland, especially in the neighborhood of Brownsville and the town of Aransas Pass. My Texas field work covered the period from May 20 to June 7 inclusive.

1. *Larus atricilla*. LAUGHING GULL.—This was found to be an abundant species and was breeding at various points in the First and Second Chain of Islands just south of San Antonio Bay. On May 21 perhaps 800 pairs of these Gulls were nesting on a series of islands covering a distance of a mile or more just back of Harbor Island near Aransas Pass Inlet. Eggs were numerous, but no young were seen. Many nests were still in process of construction. An enormous colony, numbering perhaps 10,000 or more, was guarding nests and eggs on Big Bird Island on Laguna de la Madre on May 23.

Every Laughing Gull nest found on the Texas coast was built on dry ground, a location quite different from that prevalent on the Atlantic coast, where south of New England, they seem to be built mainly on the salt marshes.

2. *Sterna maxima*. ROYAL TERN.—Royal Terns were seen at numerous points in all the salt-water bays and lagoons visited. More than 200 nests were found on a small island, back of Harbor Island near the inlet of Aransas Pass. One of the largest breeding colonies I have ever seen was discovered on Big Bird Island in Laguna de la Madre, May 23. The eggs had been deposited in very slight depressions on the open beach and, as a rule, were from fourteen to eighteen inches apart. The areas thus covered were extensive. One such egg-field was fifteen by 84 feet. Another was eighteen feet wide and 120 feet long. Stepping off a space estimated to be ten feet square I found upon counting that the area contained sixty-two nests. By measuring the various egg-fields in a similar manner I computed the number of Royal Tern nests on Big Bird Island to be 3,456. About one nest in twenty contained two eggs, all others held but one. No young were found on any of the islands.

3. *Sterna sandvicensis aculeifrons*. CABOT'S TERN.—A colony of Cabot's Terns was found nesting on Big Bird Island in Laguna de la Madre on May 23. The eggs had been deposited on the bare sand in the manner employed by the Royal Terns. There was only one egg-field. This covered an area approximately 20 by 75 feet and was estimated to hold

892 nests. Only four nests contained two eggs. All others held but one. No young were found.

Many Gull-billed (*Gelochelidon nilotica*) and Caspian Terns (*Sterna caspia*) also were occupying the island. Numerous nests of both species containing eggs were examined and many young Caspians were seen.

4. *Pelecanus erythrorhynchos*. WHITE PELICAN.—It may not be known generally that of the numerous White Pelicans resorting to the coast of the Gulf of Mexico in winter a few remain when the great flocks move northward in spring. On June 12 and 13, 1918, I found about 70 among the Brown Pelicans at Timbalier Pass, Louisiana. So far as I am aware there has been no published record of their breeding in these southern waters. I was, therefore, greatly surprised on May 23, 1920, to discover a colony of nesting White Pelicans on Little Bird Island in Laguna de la Madre. Fifty adults were seen, eighteen young and fourteen eggs were counted. Photographs were secured of both old and young. The nests were on the ground and were composed of very small quantities of weed stalks and similar vegetation, which could readily be gathered locally. The birds were shy and the last ones left their eggs and young when we were still within 75 yards of them. They returned and passed overhead a few times, after which they settled on the water some distance away.

White Pelicans were seen at three other points on the coasts: one in a colony of Brown Pelicans on Dunham Island, Aransas Bay, May 26; two near Point Isabel, June 2; and about thirty near Green Island, Laguna de la Madre, June 3.

5. *Pelecanus occidentalis*. BROWN PELICAN.—When in 1918 I cruised the Gulf coast of the United States at the request of the Federal Food Administration to make a census of the Brown Pelican population and secure data on its feeding habits, I estimated the Brown Pelicans on the Texas coast not to exceed 5000. Owing to misinformation I did not at that time succeed in visiting all their breeding places. This survey I believe I have completed during the present season and I am of the opinion that my former estimate of their numbers was a liberal one.

On a small shell lump near Dunham Island, at the northern extremity of Aransas Bay, we found on May 26, a breeding colony of these birds. This little isle varied from fifteen to twenty-five feet in width and was about 150 feet in length. Young pelicans to the number of 304 were found and with the exception of about a half dozen all were large enough to leave the island and swim away upon our approach. As the young waddled over the shells twenty of them disgorged varying quantities of the fish they had lately consumed. An examination showed that with the exception of three mullet all were Gulf menhaden, fish never used for human consumption, but because of their oily character are undoubtedly nutritious for growing Pelicans.

Farther south, on Dead Man's Island, near Corpus Pass, a colony of

Brown Pelicans estimated at 2,000 was breeding. Here also the season for eggs had nearly passed. I have never seen any place where Pelicans were so tame as on Dead Man's Island. It was an easy task to stand in the open and repeatedly photograph the entire pelican population, the nearest birds being not more than fifteen feet distant. This visit was made on May 23.

The same day at Big Bird Island in Laguna de la Madre 48 pelicans nests were found. There were no young here. The number of eggs to the nest ranged from three to five. One nest, isolated from the others at a distance of at least 200 yards, was found to contain eighteen eggs! A pelican was sitting on them when we approached. There were no signs to indicate that eggs had been placed there by other than natural means, although it is hardly conceivable that one bird could have deposited so many.

6. *Ajaja ajaja*. ROSEATE SPOONBILL.—On May 24, while driving in company with William L. and Irene Finley, at a point about five miles north of Aransas Pass, we came upon a flock of thirty-six Roseate Spoonbills. They were standing in shallow water on the leeward and sunny side of a thick tulé marsh. As they flew away we all remarked on the very dark appearance of one of the birds. A little later while we watched them feeding in a salt lagoon the dark bird was again in evidence. The next day at about the same hour we again found the flock resting at the identical spot by the tulés. It numbered forty-three on this occasion. While for twenty minutes Mr. Finley made moving pictures of them at a distance of 225 feet, Mrs. Finley and I again directed our particular attention to the peculiar member of the flock. The bird stood in a strong light and with field glasses we had every opportunity to examine it at leisure. The feathers of the entire neck, breast and most of the back were glossy black. Undoubtedly it was a melanistic specimen, one of those apparently rare occurrences among birds.

Spoonbills were noted elsewhere along the Texas coast as follows: May 26, five were seen in Mesquite Bay; May 27, flocks of six and twenty-six were observed in the same general neighborhood; May 28, eighteen were found near Port O'Connor, and the same evening two were discovered in Matagorda Bay. On May 28 at the southern end of San Antonio Bay, thirty-two were seen. On June 2, spoonbills to the number of eleven arose with a great flock of Wood Ibises from a lagoon between Brownsville and Point Isabel.

None were found breeding on the Texas coast. There is a widespread impression in this region that these so-called "flamingoes" breed early in Mexico and later migrate to Texas. This may be true of many but others probably breed in Texas as on May 18, 1920, I visited a colony of breeding spoonbills on Cameron Farm in Cameron Parish, Louisiana, at which date no young were seen. Five nests were examined and all

contained eggs. Eighty-seven spoonbills were here observed in the air at one time, and seventeen others were frightened from their nests immediately after this count was made.

7. *Casmerodius egretta*. EGRET.—This appears to be a rare species today along the lower Texas coast. Five individuals were seen during my trip to these waters in June, 1918. This year only two were identified with the exception of those found breeding on May 29 in a heron colony on Wolf Point Ranch, Caranchua Bay, in Calhoun County. Possibly fifty pairs were nesting here. Many young were out of the nests and climbing about over the bushes.

8. *Egretta candidissima candidissima*. SNOWY EGRET.—SNOWY Egrets to the number of possibly 75 pairs were found breeding in the Wolf Point Ranch rookery on May 29. Young in various stages of growth were seen and a few nests held eggs. At least two pairs were breeding in the Green Island rookery, Laguna de la Madre, June 3. On May 28, five birds were seen on a sand point in Matagorda Bay and one was identified near Point Isabel on June 2.

9. *Dichromanassa rufescens*. REDDISH EGRET.—In 'Bird-Lore,' Vol. XX, page 384, I reported having found a breeding colony of these egrets on the Second Chain of Islands, north of Mesquite Bay, Texas, on June 20, 1918. A point of interest attaching to this discovery is that there appears to have been few, if any, records of this species breeding in the United States of recent years.

On May 21, 1920, I again visited this group of islands in company with Mr. and Mrs. Finley. The heavy growth of Spanish bayonet plants, mesquite and other bushes that covered the islands at the time of the former visit had largely disappeared and only a few dead mesquites were left. Furthermore the island chiefly occupied by the birds had been greatly reduced in size as a result of high storm tides. Six small islands of the group were this year found serving as nesting places for various herons. I estimated that about 500 pairs of Reddish Egrets were present. Perhaps the total population of Ward's Herons, Black-crowned Night Herons and Louisiana Herons numbered about the same. One young Reddish Egret in the white phase of plumage was found among the hundreds of young birds that were running about in the weeds under foot. One adult white bird was found dead beside its nest. These were the only white specimens seen.

Young in all stages were found and some nests contained eggs. The nests were in bushes, on drift, and on the ground. On one island, many had been built in wild sunflower plants at distances varying from one foot to three feet from the ground.

On Big Bird Island south of Corpus Christi, six Reddish Egrets were seen and two nests, one with eggs and one with young, were observed. These nests were on the ground.

On June 3, 1920, in company with R. D. Camp of Brownsville and George C. Shupee of San Antonio, a visit was made to Green Island lying in Laguna de la Madre 32 miles north of Point Isabel. So far as I am aware this island has been unknown to modern ornithologists. The greater part of its forty acres or more consists of a flat sand beach. Perhaps eight or ten acres is higher and this portion at its northern end rises to the height of fourteen feet, above the beach. The wooded area was found to be densely covered with a miscellaneous growth in which mesquite, prickly pear cactus, Spanish bayonet and maguey predominated. The whole brush-covered area was used by a breeding colony of herons that may have numbered from 5,000 to 10,000 birds.

The dominating species was the Reddish Egret. Thirteen adults in the white phase of plumage were counted. The remaining species in the colony consisted of Ward's, Louisiana and Black-crowned Night Herons in about equal numbers. A few Snowy Egrets also were present and breeding.

Reddish Egrets in small numbers were found on suitable feeding grounds at various points from Mesquite Bay southward to Brazos Pass at the south end of Padre Island.

10. *Ortalis vetula mcalli*. CHACHALACA.—Since this bird was first discovered in the United States by Sennett nearly thirty-five years ago very little has been written about its habits and activities, although it is known to be a resident in Cameron and Hidalgo Counties, Texas.

It is a bird highly esteemed for food and is relentlessly persecuted by local gunners. This, added to the fact that it is of very local distribution and the particular regions where it is found are rapidly being cleared for agricultural purposes, points strongly to its rapid disappearance from the United States. I talked with a gunner in Brownsville who stated he had hunted in that section every season for eighteen years but had never killed a Chachalaca nor had he been able even to see one. I had the good fortune to establish pleasant relations with two men who know many of the secrets of these birds and on June 6 they took me to a thick growth of scrub timber some eight or ten miles from Brownsville and introduced me to the Chachalaca.

The first ones found were an adult with two young running on the ground beneath the trees. Although both my companions saw them they escaped my notice. Five minutes later, however, one was pointed out sitting in a tree perhaps fifteen feet from the ground and within a few minutes I was able to get a not altogether satisfactory photograph of still another standing on a bare limb. A heavy rain storm ensued. As soon as the sun came out the Chachalacas appeared in all directions, usually standing in the tree-tops in such a manner that their heads were about on a level with the topmost leaves. Here while they dried their feathers they carried on a concert that we found highly exhilarating. We must have heard fifty calling that afternoon and as far as I could distinguish in every

instance but one the birds called in pairs. In calling there would be one loud note followed by two lower, shorter notes. Almost at the instant the second short note was given the other bird, presumably the female, in a higher pitched voice would give a loud call followed by two lower, shorter notes. Then her companion would instantly respond. The calling would continue with great intensity, volume and astonishing carrying power over a period of one minute or more. Vainly I strove to make the word "chachalaca" out of their notes, yet I presume it sounded as much like that word as anything else. Local white gunners call this bird the "Chatch-a-lac"; the Mexicans call it "Shack-a-lac-a." The notes reminded me of the cackling of guineas, and also of a medley of stringed instruments with a nasal tone running through it all.

I found the birds suspicious and very quick in detecting an intruder. When alarmed they produced a low cackling note repeated with rapidity and without modulation.

Those seen on dead limbs or in the open frequently took the attitude often assumed by turkeys when alarmed on a roost, the body, neck and tail assuming a straight horizontal position. Frequently one would alight on a twig so small that it would experience difficulty in retaining its perch, but even here with its great tail spread and round wings waving in an attempt to regain its balance, it was never too much engaged to begin instantly its wild song if its companion led the way.

Bendire in 'Life Histories of North American Birds,' quotes J. A. Singley as saying in connection with the nesting of the Chachalaca on the Lower Rio Grande:

"All the nests I found were in mesquite stubs, where the limbs had been cut off to make brush fences. The limbs were never cut close to the tree, and being close together form a cavity; leaves and twigs will fall in this and accumulate, and the bird occupies it as a nesting site. I did not find a nest that I could say was built by the bird."

The one nest pointed out to me as being of this species had the general flat appearance of a dove's nest, but somewhat larger and more substantial. It was on the limb of an ebony tree about eight feet from the ground.

Chachalaca eggs are frequently hatched under hens by the Mexicans and the birds afterwards kept in captivity. In Brownsville I saw one of seven that had been raised from nine eggs taken from three nests in 1919.

11. *Columba flavirostris*. RED-BILLED PIGEON.—This species was found on June 6 when visiting the territory occupied by the two colonies of White-winged Doves mentioned elsewhere. It is a handsome bird about the size of the Domestic Pigeon and locally known as the "Blue Rock." About fifteen of the birds were observed, some of them at a distance not greater than twenty yards. One was frightened from its nest in an ebony tree about seven feet from the ground. It was, for a pigeon, a fairly substantial one made of twigs and was placed on a horizontal limb. It contained one egg.

12. *Leptotila fulviventris brachyptera*. WHITE-FRONTED DOVE.—The peculiar, deep-throated notes of the White-fronted Dove were heard on eight occasions during the afternoon of June 6 while in the neighborhood of the White-winged Dove communities. Only one bird was seen and no nests were found.

13. *Melopelia asiatica*. WHITE-WINGED DOVE.—These birds were found to be very common in Cameron County. In passing along the roads in the neighborhood of Brownsville, one may frequently see them sitting on way-side posts or trees, or flying overhead, much in the manner of the Mourning Dove.

I had never read or heard that these doves accumulate in numbers to breed, and it was a source of much surprise to find them actually nesting in communities. About six miles east of Brownsville there is an extensive palm grove, known as Los Palmas. Nearby is a thick growth of huisache trees covering ten acres or more. Upon approaching this dense, scrubby forest my attention was immediately attracted by the cooing of doves and upon entering its almost impenetrable interior the impression grew that the whole world, so far as one could judge by sounds, was a wild natural dove cote.

In this area many hundreds of doves must have been nesting. The nests were not placed closely together as was the habit of the Passenger Pigeon, but several were readily found. Those examined all contained eggs. Two seemed to be the universal number. This was on June 1.

On June 6 I visited two other regions where the White-winged Dove was nesting in great numbers. These were located eight or ten miles in another direction from Brownsville. The spots selected consisted of very thick growths in which mesquite, huisache and ebony were noticeably abundant. Here likewise the number of doves was truly astonishing to one who had never seen representatives of this family nest, except in isolated pairs. Eggs and newly hatched young were found on this date.

The calls of the White-winged Dove can readily be distinguished from those of the other doves of the region. The most common note strongly suggests the hoot of the Great Horned Owl softened by distance. All three of these breeding places were in the immediate neighborhood of 'resacas' (ponds).

14. *Coragyps urubu*. BLACK VULTURE.—So far as I was able to determine this vulture out-numbered the Turkey Vulture along the lower Texas coast by at least ten to one. They were found at all the heron and Pelican colonies, where they doubtless feed on the many young birds that always perish about a rookery. One of the Audubon Association's wardens in Florida some years ago reported having seen these birds kill and devour the young of the White Ibis and it is of course possible that they engage regularly in such practices. On four occasions I saw Black Vultures fly out from thick growths of cactus and thorn bushes in such

manner as to indicate they had been frightened from their eggs or young. In only one instance did I penetrate one of these dense, thorny thickets in quest of the nest. This was on a small island about a mile from the Dunham Island Pelican colony. Two young that reminded one of large short-tailed roosters were found. They bit viciously when taken in the hand but otherwise were very gentle and posed admirably before Mr. Finley's moving picture camera. The black wing and tail feathers were in evidence, but otherwise their bodies were covered with a down, light brown in color and therefore noticeably different from the white of the young Turkey Vulture.

15. **Crotophaga sulcirostris.** GROOVE-BILLED ANI.—Six of these birds we found in the scrub near Brownsville on June 6. On three occasions I listened to their somewhat harsh, oft-repeated notes. On the ground in a dense thicket I found the complete shells of two Ani eggs. Both were broken across the center and appeared to have been removed from the nest after the young had hatched. One Ani found in the immediate vicinity of the eggs was very tame and appeared reluctant to leave the neighborhood.

A short examination of the adjacent trees failed to reveal the nest and matters of a pressing nature prevented a more extended search.

16. **Corvus brachyrhynchos brachyrhynchos.** COMMON CROW.—On Wolf Point Ranch in Caranchua Bay seven Common Crows were seen on the afternoon of May 28. Mention is made of this fact because of the rarity of the species in that part of the country. During the entire time spent in southeastern Texas these were the only crows observed, and the inhabitants of the country when asked about the bird uniformly stated that it was never seen in that region.

17. **Megascopus major macrourus.** GREAT-TAILED GRACKLE.—One of the most noticeable, noisy, and abundant species of birds along the lower Texas coast is the Great-tailed Grackle. It possesses an astonishing repertoire of whistles, calls, and guttural sounds and one sees or hears them everywhere. On islands surrounded by salt-water it is found and one may see it also about fresh-water ponds, or in the towns and on the high prairie or chaparral lands if water of any kind is in the vicinity.

These grackles are very active and the great, glossy, black males assume many striking attitudes. One of their favorite manoeuvres is for two to face each other, where with necks extended and with bills pointed directly upward to the extreme limit of possibility they will stand in a strained and rigid attitude for a time as if seeking to outdo each other in a contest of endurance.

On Big Bird Island in Laguna de la Madre, where there was a total absence of trees or bushes, the grackles had built their nests in weeds from one inch to a foot and a half from the ground. I found their nests

in the heart of a tule marsh near Aransas Pass and in all the heron colonies visited.

Near the main buildings on the Wolf Point Ranch in Calhoun County, the prairie is decorated by two "motts." In local usage the word "mott" means a thick growth of slender live-oak trees. The combined area of these two motts is certainly not over an acre and a half in extent, yet they held on May 29, not less than 1,000 nests of the Great-tailed Grackle. The noise produced by the birds could be heard from the deck of the yacht where we lay at anchor half a mile distant.

As mentioned above these birds were found in all the heron rookeries I visited, nor did they display any hesitancy in placing their nests in the immediate proximity of those of other species. An extreme example of this custom which also serves to illustrate how many birds may crowd their nests together when good sites are scarce, was found in one of the colonies on the Second Chain of Islands group.

A dead and uprooted mesquite bush was found, the entire top of which was covered by two Ward's Herons nests. One held five eggs and the other was the home of three large young that walked off and climbed to the ground, as we approached. These nests were only about five feet from the ground, yet beneath them and in the same bush were found the following occupied nests; three of the Louisiana Heron, two with young and one with eggs; one of the Black-crowned Night Heron with three young, and four nests of the Great-tailed Grackle all containing young. Nor was this all, for on the ground under the bush was an unoccupied nest of the Ward's Heron and a Reddish Egret nest with two eggs and the *while* parent lying dead beside it.

In addition to the above many other species were observed and more or less notes made of their nests, feeding habits, or distribution. Among these were the following:

Sterna antillarum. LEAST TERN.

Hydrochelidon nigra surinamensis. BLACK TERN.

Rynchops nigra. BLACK SKIMMER.

Anhinga anhinga. WATER TURKEY.

Phalacrocorax vigua mexicanus. MEXICAN CORMORANT.

Fregata aquila. MAN-O'-WAR-BIRD.

Anas fulvigula maculosa. MOTTLED DUCK.

Marila valisineria. CANVAS-BACK.

Plegadis guarauna. WHITE-FACED GLOSSY IBIS.

Butorides virescens virescens. GREEN HERON.

Fulica americana. COOT.

Himantopus mexicanus. BLACK-NECKED STILT.

Catoptrophorus semipalmatus inornatus. WESTERN WILLET.

Oxyechus vociferus. KILLDEER.

Ochthodromus wilsonius. WILSON'S PLOVER.

Arenaria interpres morinella. RUDDY TURNSTONE.

Haematopus palliatus. OYSTER-CATCHER.
Colinus virginianus texanus. TEXAS BOB-WHITE.
Zenaidura macroura carolinensis. MOURNING DOVE.
Chaemepelia passerina pallescens. MEXICAN GROUND DOVE.
Scardafella inca. INCA DOVE.
Polyborus cheriway. AUDUBON'S CARACARA.
Geococcyx californianus. ROAD-RUNNER.
Ceryle americana septentrionalis. TEXAS KINGFISHER.
Dryobates scalaris bairdi. TEXAS WOODPECKER.
Centurus aurifrons. GOLDEN-FRONTED WOODPECKER.
Chordeiles acutipennis texensis. TEXAS NIGHTHAWK.
Muscivora forficata. SCISSOR-TAILED FLYCATCHER.
Pyrocephalus rubinus mexicanus. VERMILION FLYCATCHER.
Otocoris alpestris giraudi. TEXAS HORNED LARK.
Xanthoura luxuosa glaucescens. GREEN JAY.
Agelaius phoeniceus richmondi. VERA CRUZ RED-WING.
Sturnella magna hoopesi. RIO GRANDE MEADOWLARK.
Cardinalis cardinalis canicaudus. GRAY-TAILED CARDINAL.
Passerina ciris. PAINTED BUNTING.
Spiza americana. DICKCISSEL.
Vireo belli belli. BELL'S VIREO.
Mimus polyglottos leucopterus. WESTERN MOCKINGBIRD.
Toxostoma longirostre sennetti. SENNETT'S THRASHER.
Toxostoma curvirostre curvirostre. CURVED-BILLED THRASHER.
Baeolophus atricristatus atricristatus. BLACK CRESTED TIT-
MOUSE.
. 1974 Broadway, New York.

THE LATER FLIGHTS OF THE PASSENGER PIGEON.

BY FRANK BOND.

Plate XVIII.

BETWEEN the years 1872 and 1875 or 1876, eastern Iowa, for a distance of sixty or more miles west of the Mississippi River, witnessed many intermittent flights of the fast dwindling flocks of the Passenger Pigeon. At that time I was not familiar with

the stories of the pigeon flights over Ohio and Kentucky and other territory east of the Mississippi, related by Wilson and Audubon, or, probably, I should have been impressed with the difference between flights occurring prior to 1845 and those between 1870 and 1880. It will be recalled that Wilson and Audubon described the pigeon flocks as being so vast in extent that they darkened the sky for several successive days. As I read their descriptions, the pigeons literally spread a dark blanket of roaring wings over the earth, interfering with the light from the sun to the extent that a twilight condition prevailed not only all day but for several days in succession.

The rapid destruction of the pigeons between the dates mentioned should, one would think, have warned thoughtful students of wild life of the complete destruction of this edible species at an early date, but if fears existed the publications of the period do not appear to have been utilized for the purpose of arousing public interest and concern therein. So to us in the 70's the flights of pigeons seemed tremendous and were wholly without a warning thought or suggestion that the hundreds of thousands, or possibly millions, we saw passing over were but the fast disappearing remnants of the billions that turned day into night much less than fifty years before.

These later flights of the Passenger Pigeon were unlike those described by Audubon and Wilson. They were as direct, as swift, as full of evident purpose, as those of the earlier years, but the sadly reduced numbers of the birds did not permit of clouds that blanketed and darkened the skies.

I have presented herewith a reproduction of a water color sketch of the pigeon flights of the early 70's, as I remember them. The birds flew in long lines or ranks, endless as far as we could see, extending from one horizon to the other, or at least far enough for the ends of the lines to be swallowed up in the haze and mists of distance. These lines were by no means uniform in density throughout. The birds were unevenly distributed. At times there would be larger and denser bodies, often connected by continuous thinner lines, or even separated here and there by an open space, or a space containing so few birds as to appear open

at a distance. These tremendous lines of pigeons were followed by others like them, at distances apart, as I recall them, varying from a few hundred yards to a half mile or more. I can only estimate these distances from my memory of the picture the sky offered at the time. They are rough estimates only, but I remember distinctly that while the long extended lines were parallel the distances between them varied greatly. Then there was one other interesting feature of these flights that, had Audubon observed them, would very likely have suggested to his mind that even yet there lingered traces of flight instinct of the years when billions darkened the sky in impenetrable formation. Scattered at haphazard between the great bodies moving with military precision were irregular smaller flocks, varying in number from perhaps a dozen to fifty birds. Whether these had pushed ahead because of their hurry, had fallen back because of weariness, or whether accident in organizing the original flight formation was the reason for this independent and apparently unorganized flight, is open to conjecture. They looked somewhat like small scouting parties, watchful for the safety of the main armies with which they moved.

Upon reading this paper before the 1920 meeting of the American Ornithologists' Union, the question arose in discussion whether the flocks were spread out laterally or lengthwise in the line of flight like crows, and I would repeat that in my experience they were always spread out laterally as shown in my painting, advancing on a wide front.

It may be interesting also to give a brief description of one of the feeding habits of the Passenger Pigeon which I observed during the period of these pigeon flights and with which I interfered to the extent of my ability, using as a weapon an old army musket which had seen service in the Civil War but which had been smooth-bored to meet the requirements of peace conditions. Among other farm activities my father fattened cattle for the Chicago market, stuffing them chiefly with corn raised on the farm. This feeding was carried on during the winter months and when ready for the market the animals were shipped in the early spring, I think early in March, and of course the grounds of the stock-

yards, containing several acres, were covered, in fact buried deeply, with lost and partially digested grains of corn. This feast the pigeons discovered daily and thousands of them swooped down into the deserted yards until the grounds were swept clean. Here was good hunting, pot hunting pure and simple, for while the birds were most abundant no musket was aimed at a single bird on the ground or in a tree top, much less in flight. The pigeons in flocks of thousands would alight on the ground, and in the manner of domesticated pigeons, with which all are familiar, move rapidly, watchful for the corn around them, picking up the grains nearest and then, necessarily and constantly, moving forward. Of course they soon discovered that the birds in the front rank got the grain and so was presented an interesting phenomenon. It might possibly be likened to a moving waterfall, for the birds in the rear of the progressing flock continually took the air and in large numbers dropped down just in front, where the grain was plentiful.

The stockyards were located just in the edge of heavily timbered lands containing many species of acorn bearing oaks, walnut and butternut trees, and in the open glades hazel bushes. In March, of course these trees were bare of leaves and the pigeons would alight in their tops so densely that the pot shot always brought down many.

I do not know the last year the Passenger Pigeons were seen in eastern Iowa. I left the State in March, 1882, and have never returned to the woods and farm in Johnson County to which these memories have carried back. I may say, however, that for a number of years after the flights and feeding of pigeons which I have briefly described, a few birds were killed annually in the mast bearing woods of the neighborhood.

I recall seeing but the small straggling remnants, little flocks of four to six or seven birds possibly. These foraged in the tree-tops and were extremely wild and unapproachable, but what should one expect during those last days of their rapidly enforced flight toward extinction? Their going out of the world for all time suggests the similar experience undoubtedly had by the unknown and harmless race of men who, in their final struggle

for existence many centuries ago, fled from their persistent enemies to the high and inaccessible cliffs of the arid southwest, and there, in rapidly dwindling numbers, eked out a meager and miserable existence until all were gone.

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REMARKS ON THE MIGRATION OF SOUTHERN HEMISPHERE ALBATROSSES AND PETRELS.

BY LEVERETT MILLS LOOMIS.

No other migratory movements illustrate the migration of birds better than those of the albatrosses and petrels breeding in the Southern Hemisphere. With the close of the season of reproduction, there are northward movements that stop short of the equator, transequatorial ones to northern latitudes, and movements that lead in a southward direction.

The migratory movements that fall short of the equator are well exemplified in the Antarctic Fulmar (*Thalasseica antarctica*), Snowy Petrel (*Pagodroma nivea*), Lesson's Petrel (*Pterodroma lessoni*), and White-chinned Petrel (*Procellaria aequinoctialis*).

Transequatorial migration to northern latitudes is typically illustrated in the Juan Fernandez Petrel (*Pterodroma externa*), Neglected Petrel (*Pterodroma neglecta*), Mottled Petrel (*Pterodroma inexpectata*), Great Shearwater (*Puffinus gravis*), Cooper's Shearwater (*Puffinus creatopus*), Flesh-footed Shearwater (*Puffinus carneipes*), Sooty Shearwater (*Puffinus griseus*), Slender-billed Shearwater (*Puffinus tenuirostris*), and Wilson's Petrel (*Oceanites oceanicus*). The Sooty Shearwaters occurring in myriads on the Pacific Ocean off Point Pinos, California, shed a flood of light upon this phase of bird migration. On their arrival in spring, the adult ones are in worn plumage, and have dormant

gonads. As the season advances, they undergo a complete moult, and in autumn, at the time of the departure of the hosts, they are in fine feather, and display great functional enlargement of the gonads. The period of absence of this petrel from California waters coincides with its breeding season in the South Temperate Zone. It has long been a matter of record that there are breeding stations of this petrel in the New Zealand area, and recently Mr. R. H. Beck has located such a station on Wollaston Island, near Cape Horn.¹ Transequatorial migration from the Southern Hemisphere finds a counterpart in transequatorial migration from the Northern Hemisphere.

Migration after the breeding season in a direction leading away from the equator is well shown in the Galapagos Albatross (*Diomedea irrorata*), which breeds, so far as known, only on Hood Island (lat. 1° 25' S., long. 89° 42' W.), and journeys at least as far as Independencia Bay, Peru, lat. 14° 16' S.² This migratory movement corresponds to that of the Black-vented Shearwater (*Puffinus opisthomelas*) of the Northern Hemisphere.

The various types of migration occurring north and south of the equator adjust the bird population of the world to the seasons. It is therefore in the evolution of existing climatic conditions that we find the remote cause of present-day migration. In accounting for the immediate cause, it does not seem necessary to place heavy additional burdens upon heredity. The traveling habit, formed from the example of older birds, would seem incentive enough to cause an adult Galapagos Albatross to make the round trips between Hood Island and Independencia Bay. If the young are endowed with an innate desire for travel, the traveling habit would not be less readily formed. In short, bird migration is viewed as an inheritance in the species and as an acquired habit in the individual.

In considering the return journeys of the Galapagos Albatrosses to Hood Island, we are confronted with the question, how do migrating birds find their way over the ocean. Are they guided

¹ Amer. Mus. Journ., 1918, p. 111.

² Cf. Coker, Proc. U. S. Nat. Mus., Vol. 56, pp. 461, 462: cf. Proc. Calif. Acad. Sci., Ser. 4, Vol. 2, Pt. 2, pp. 75, 76.

by an unexplained sense of direction, or are they guided in their course by landmarks when near the land and by persistent water and air currents when remote from the land? The question is fairly before us, and we must answer it with evidence. Apparently direct evidence is found in the behavior of shearwaters beset by fog off the California coast. The following is selected from the record of a series of observations made by myself some years ago:¹

September 26. As soon as the boat was fairly clear of the land, flocks of shearwaters, hurrying along the south shore of Monterey Bay, were dimly discernible through the fog. Before Point Pinos was reached, it was manifest that there was an extensive movement in progress. At the outset Sooty Shearwaters were well represented, but in a little while only the Black-vented appeared in force. After passing Point Pinos, instead of altering their course and heading south as is their wont when the coast is clear, all the shearwaters proceeded directly out to sea. The fog was so thick, that the outlying rocks at Point Pinos could scarcely be perceived from the kelp. The coast-line to the southward of Point Pinos was invisible, and the ocean seemingly boundless space, where the birds apparently lost their bearings and became bewildered, for a return movement set in when the fog was densest. At the same time others continued to arrive from up the coast; the outward-bound ones passing close to Point Pinos and the inward-bound ones in the vicinity of the whistling buoy, anchored several hundred yards offshore. After a while many flew about at random and a large flock congregated on the water. When the shore-line south of Point Pinos became visible, the birds immediately resumed their journey southward.

October 2. At seven in the morning, flocks of Black-vented Shearwaters were passing along the south shore of Monterey Bay, almost at the surf, a thick fog hiding the land. They came from the east and disappeared in the west. Following in their wake, I soon discovered that close to the shore an avenue of flight was established, along which many flocks were heading toward

¹ Proc. Calif. Acad. Sci., Ser. 3, Vol. 2, pp. 281, 284.

the ocean at Point Pinos. They displayed an unusual timidity, sheering wildly from the boat as it loomed up before them out of the fog. The belt of kelp and the land seemed also to fill them with fear, those happening between these bugaboos being in especial straits, shunning first the one and then the other. By the time I reached Point Pinos orderly movement had nearly ceased, confusion reigning. The birds were flying about in all directions— those in extreme bewilderment, in circles. Between half past nine and ten, the fog lightened sufficiently to reveal the shore-line south of Point Pinos, and immediately order was restored, and regular progress southward resumed.

If migratory birds are endowed with a superhuman sense of direction, tantamount to a sixth sense, why were these shearwaters bewildered when the land was hidden by fog? Why did they immediately proceed on their journey when the fog was dispelled sufficiently to reveal the landmarks? If they had possessed any directing faculty other than the faculty of locating position by observing physical phenomena, it would not have failed them in these instances.

The Brandt's Cormorants nesting in the vicinity of Point Pinos and my boatman had no difficulty in finding their way in the fogs that bewildered the shearwaters. They were at home on this bit of coast, and in consequence kept their bearings in the fog. But the shearwaters migrating down the coast had no opportunity of determining their position by local landmarks, and consequently lost their way like the captain of a coaster who beached his vessel, on a still, foggy night, two miles south of Point Pinos, supposing that he was entering Monterey Bay.

It is clear that Galapagos Albatrosses in returning from mainland waters to their rookery on Hood Island must have other means of guidance than landmarks. A glance at a current chart reveals that the cold Humboldt Current, "with its steadily and visibly flowing waters," leads directly to the Galapagos Islands. A physical means of guidance is therefore not wanting.

In plotting the metes and bounds of all the albatrosses and petrels, it has been disclosed that the trade-winds apparently form habitat boundaries. For example, in the Southern Hemisphere,

away from the influence of the land, the northward range of certain species appears to end at the southern limits of the south-east trades; as in the Wandering Albatross (*Diomedea exulans*), Long-winged Petrel (*Pterodroma macroptera*), and White-chinned Petrel (*Procellaria aequinoctialis*). In the Northern Hemisphere, a corresponding restriction of range seemingly occurs in the Black-footed Albatross (*Diomedea nigripes*).

The behavior of the Shearwaters in the fog off the California coast, the existence of a definite waterway between the mainland and Hood Island, and the apparent influence of the trade-winds in limiting habitats, seem to justify the conclusion that migrating birds are guided by physical phenomena, and not by a mysterious sense of direction. In fine, the solution of the problem is not found in the marvelous.

It has been well said: "The day is passing when scientists seek to employ striking or extraordinary phenomena in the solutions of their problems; rather are they looking to that which appears insignificant and commonplace."

Care, California Academy of Sciences, San Francisco, Calif.

THE ABBREVIATED INNER PRIMARIES OF NESTLING WOODPECKERS

BY JAMES P. CHAPIN

Plate XIX

WHILE examining nestlings of Woodpeckers, some years ago, belonging to the African genera *Chrysopicos*, *Campethera*, and *Dendropicos*, I noticed that the innermost primary of the first or "juvenile" set of remiges was always remarkably small and weak, (Fig.1) and thus utterly unlike its representative in the adult plumage. There, on the contrary, the first primary is nearly as long as the second and third, thus filling its place normally in the graded series of wing-quills. The young of another African wood-peck-

er, *Mesopicos goertae*, likewise showed reduction of the same¹ quill, but somewhat less in degree.

The term "juvenal" is here employed in the sense proposed by Dr. Dwight² as the name for the plumage immediately succeeding the natal down, or where there is no such down, as in the Picidae, for the first plumage of the young bird.

In order to see this tiny feather, however, it is essential to have very young individuals, with the loerng primaries not yet completely grown, for as soon as the

latter have attained their full length the diminutive feather is at once molted, and its replacing quill comes in as large as that of adults. Thus a young wood-pecker which has already left the nest will seldom show the juvenal first primary. With the renewal of this first primary begins the post-juvenal molt of the remiges, so characteristic of young woodpeckers, ushering in the normal adult proportions of the wing.

So far as I am aware, no writer has yet called attention to this unique phenomenon, which cannot be exactly compared to the reduction of the first (outermost) secondary in the Phasianidae, since the feather there remains small throughout life, nor to the retarded development of the outer juvenal primaries in this same family and in *Opisthocomus*,³ where they are not preceded by any small fore-

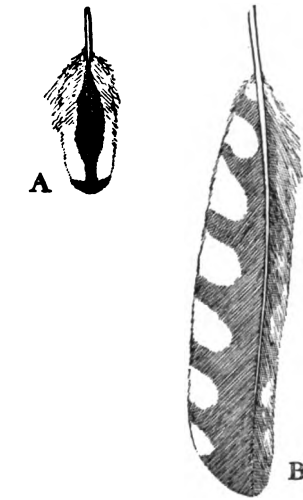


FIG. 1. *Dendropicos poecilolaemus*. First innermost primary in (A) juvenal and (B) adult plumage of female. $\times 1$.

er there remains small throughout life, nor to the retarded development of the outer juvenal primaries in this same family and in *Opisthocomus*,¹ where they are not preceded by any small fore-runners.

Wondering whether this condition was of common occurrence among young Picidae, I next examined the nestlings of some of our common American species, and found that in the flickers a

¹ In this article the primaries will be numbered from the carpus outward.

² Annals N. Y. Acad. Sci., XIII, 1900, p. 106.

³ See Pycraft, History of Birds, 1910, pp. 242-244.

still more unusual case presented itself, inasmuch as *two* inner primaries were shortened. The young Hairy and Downy Woodpeckers, likewise, had both the first and the second primaries dwarfed. Here again these reduced feathers are lost, and replaced by very much larger ones, at the outset of the post-juvenal molt.

In Mearns' Woodpecker and the White-headed Woodpecker both the first and the second primaries show similar arrested development in the juvenal plumage; but in the Red-bellied Woodpecker it is clear that the second is not affected, becoming at once full-sized, while the dwarfed first primary is shed at a very early date. The Haitian *Centurus striatus* resembles the Red-bellied; and the young Red-headed Woodpecker, similarly, has not more than one inner primary of reduced proportions. In the last-named species the post-juvenal molt, as Dr. Stone has pointed out,¹ is greatly retarded. So while the first primary is renewed at a time earlier perhaps than in other woodpeckers, all the remaining primaries are retained until about December. This is easily determined from the duller coloration of the juvenal quills.

To Mr. Outram Bangs I owe the opportunity of examining a nestling Ivory-billed Woodpecker, which I find to have the second primary markedly reduced, and the first apparently even more so. Still, the first juvenal feather has perhaps already been shed, and the young feather now wholly enclosed in its sheath may be a representative of the succeeding or "first winter" series. Young specimens of three South American species often referred to *Campephilus*, however, which are just renewing the first primary, show clearly that there is no reduction of the second quill—a surprising difference from the North American species. In a member of the Pileated group on the other hand, *Ceophlæus lineatus*, from Mexico, both the first and second primaries of the nestling's wing undergo reduction.

Among European woodpeckers, the Green Woodpecker and the Great Spotted Woodpecker were next examined, and both of them were found to have two inner primaries of dwarfed size in the juvenal set (Fig. 2). *Xiphidiopicus percussus* of Cuba and *Hypoxan-*

¹ Proc. Acad. Nat. Sci. Phila., 1896, p. 129.

thus rivolii of Ecuador have only one inner primary reduced, about as in *Chrysopicos*. In the U. S. National Museum there were specimens, sufficiently young, of two East Indian forms, *Tiga javanensis* and *Meiglyptes grammithorax*, which showed a single reduced primary, the first, in each case. That of *Meiglyptes* was decidedly small, but in *Tiga* the feather was of the same relatively large size as in *Mesopicos goertae*.

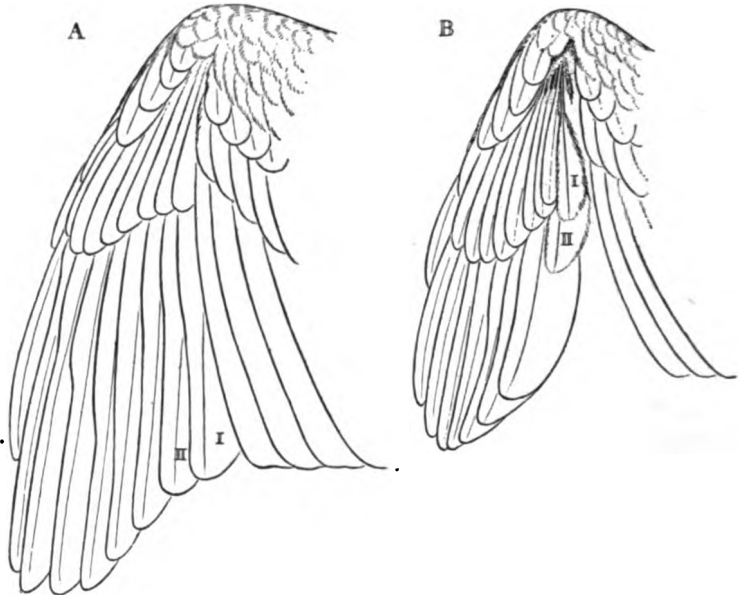


Fig. 2. *Picus viridis*. Wing of (A) adult; (B) Young, from above. $\times \frac{1}{2}$

By this time it was only natural that I should conclude the reduction of one or more inner primaries of the nestling to be a family character of the Picidae. The piculets, to be sure, might not exhibit it, for three rather young, though fully fledged, specimens of *Verreauxia africana* failed to show reduced wing feathers or even a subsequent post-juvenal molt. Yet they perhaps represent a family apart, more similar to the barbets than are the true woodpeckers.

Great was my surprise, consequently, on examining a nestling of the Yellow-bellied Sapsucker, Fig. 3. to find that none of the inner primaries, not even the first, was any smaller relatively than it would be in the adult. The same was true of the wings of fledglings in the Red-naped, Red-breasted, and Williamson's Sapsuckers; so the genus *Sphyrapicus*, as a whole, offers a notable exception to the general rule of reduction, or more accurately speaking,

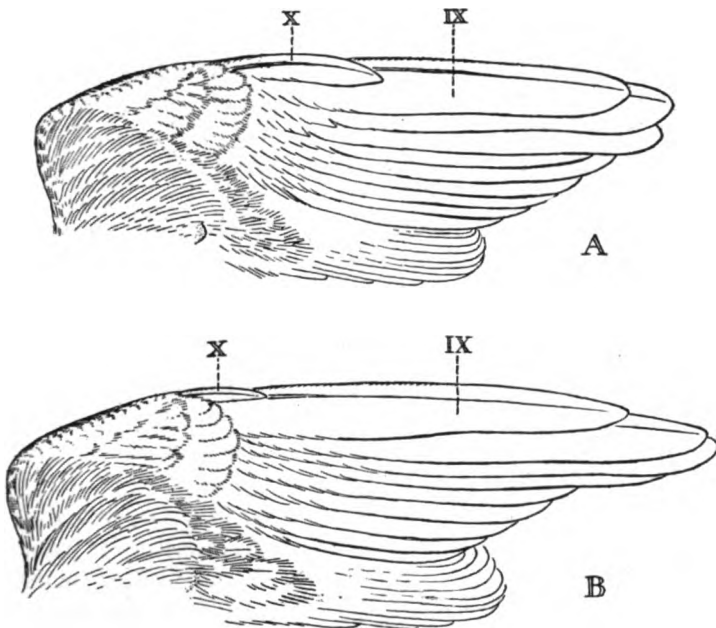


Fig. 3. *Sphyrapicus v. varius*. Wing of (A) young (B) adult from below showing large size of the 10th (outermost) primary (X), in the juvenal plumage $\times \frac{3}{4}$

of arrested development. Among the Sapsuckers the post-juvenal molt of the primaries takes place very early, as in most other young Woodpeckers, but the juvenal body plumage is retained for an unusually long period, much of it until the following spring, as in the Red-headed Woodpecker.

Still another exception was disclosed by *Leuconerpes candidus*, a South American form apparently allied to *Melanerpes*. The

condition of the inner primaries, when the wings of the young bird are almost full-grown, is essentially the same as in *Sphyrapicus*, with no loss of length in either first or second primaries. The first is a little narrower than in the adult condition, but that is all.

A third genus of woodpeckers showing no shortening of the juvenal primaries is represented by Lewis's Woodpecker. Even the innermost grows out to adult proportions, without any narrowing.

Toward the end of my search one Neotropical species was studied which bridges the gap, it appears, between reduction of the first primary and its full development, in the young. *Chrysoptilos melanolaimus*, of Bolivia, shows a first primary somewhat longer than that of *Mesopicos goertae*, yet not of full adult proportions.

The young of thirty species of woodpeckers have now been examined, illustrating all the main groups of the family. These investigations may be carried much further by anyone who possesses suitable examples of very young woodpeckers, whether alive, or as spirit-specimens, or skins. In the last case the wings can be relaxed by surrounding them for a day or two with wet cotton, after which the carpal joint is gently manipulated until the wing can be opened, and the quills examined not only with ease but without injury to the specimen.

It was in this manner that I was obliged to secure a large part of my data, and of the material for the accompanying figures. The gap in these drawings between the primaries and secondaries has been somewhat accentuated, by pushing back the latter, so as to show clearly the feathers under discussion. And for the same reason, in all views from above, the lower coverts, since they show no unusual features, have been ignored. A more exact and detailed statement of facts may here be added for future investigators.

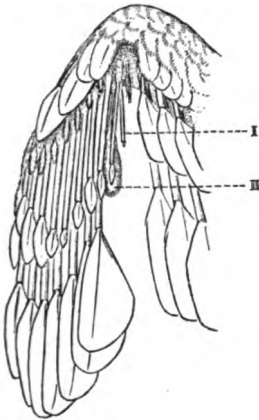
Ceophloeus lineatus similis (Lesson)

Fig. 4 C is taken from a rather young nestling, A. M. N. H., No. 81336, Xicotencatl, Tamaulipas, Mexico. All the longer primaries are still growing; length of wing 111 mm., whereas the adult wing measures 185 mm. The two reduced inner primaries have already reached their

full development, I measuring 35 mm. (adult size 123 mm.), and II, length 52 mm. (adult length 130 mm.).

Dryobates major pinetorum (Brehm).

Fig. 5 C shows the wing of a nestling (♀ ?) from Dept. Cote-d'Or,



Balanophrya formicivora aculeata



Campothera nivosa herberti



Ceophloeus lineatus similis



Colaptes auratus luteus

Fig. 4. Wings of nestling woodpeckers from above $\times \frac{3}{4}$.

France, A. M. N. H., No. 150932. Long primaries still sheathed at bases, length of wing 98 mm. (ad. length 130 mm.). No. I still entirely enclosed

in sheath, evidently not full-grown, measuring but 13 mm. (ad. l. 81 mm.); but No. II is fully grown, only 35 mm. long (ad. l. 86 mm.).

Dryobates villosus villosus (Linnaeus).

A rather large nestling examined, from Mastic, N. Y., July 8, 1916, coll. J. Dwight, No. 44165. Length of wing 80 mm. (ad. l. 81 mm.). Primaries I and II have attained full size, I measuring 17 mm. (ad. l. 81 mm.), II only 24 mm. (ad. l. 83).

Dryobates pubescens medianus (Swainson).

Fig. 5 B from nestling (♀), Washington Co., Maine, A. M. N. H., No. 113788, June 14, 1878. Length of wing only 71.5 mm. (ad. l. 94 mm.). All primaries still have sheaths except II and X. No. II, although full-grown, is only 22 mm. long (ad. l. 63 mm.), but has much the same pattern of color as the tip of No. III. No. I in both wings is in the sheath and very short, protruding only 3.5 mm.

This little stub might have been taken for the juvenal first primary, had I not found, on opening out the right wing, that the juvenal quill had just been shed, and was lying loose between the neighboring feathers. It measured 18 mm. in total length, but of this some 3 mm. would have been buried in the wing. There are thus two juvenal primaries of reduced size, as in *D. villosus* and *D. major*.

Xenopicus albolarvatus albolarvatus (Cassin).

Two young birds, male and female, from El Dorado Co., California, A. M. N. H. Nos. 87314, 87322, about ready to leave the nest, having wings of 104 and 97 mm. respectively (ad. l. 127). In both cases all the primaries had sheaths at the base except No. II. This feather was of reduced size, fully grown, but only 44 and 39 mm. long (ad. l. 80 mm.). No. I in both cases was still very small, entirely sheathed, 19 and 10 mm. long; these were undoubtedly the first winter feathers coming in, after the shedding of the small juvenal quills.

Colaptes auratus luteus Bangs.

Fig. 4 D was drawn from a young nestling, taken in the vicinity of New York. Greater primary-coverts, as well as most of the primaries, are still in the sheath, but Nos. I and II are fully developed, both being dwarfed. No. I has been raised above its covert.

Measurements from another young bird, Bay Shore, N. Y., June 29, 1909, A. M. N. H., No. 103896, are as follows: Wing, 101 mm. (ad. l. 156 mm.); juvenal primary No. I, 26 mm. (ad. l. 102 mm.); juvenal primary No. II, 40 mm. (ad. l. 107 mm.).

Picus viridis viridis Linnaeus.

Fig. 2 B, of a young female from Renthendorf, Saxony, A. M. N. H., No. 571. Wing not quite fully grown, length 120 mm. (ad. l. 160). The

two inner primaries fully developed, but conspicuously shortened; No. I measuring 38 mm. (ad. l. 102), No. II, 52 mm. (ad. l. 106 mm.). No. I has been raised above its covert so as to bring it into view.

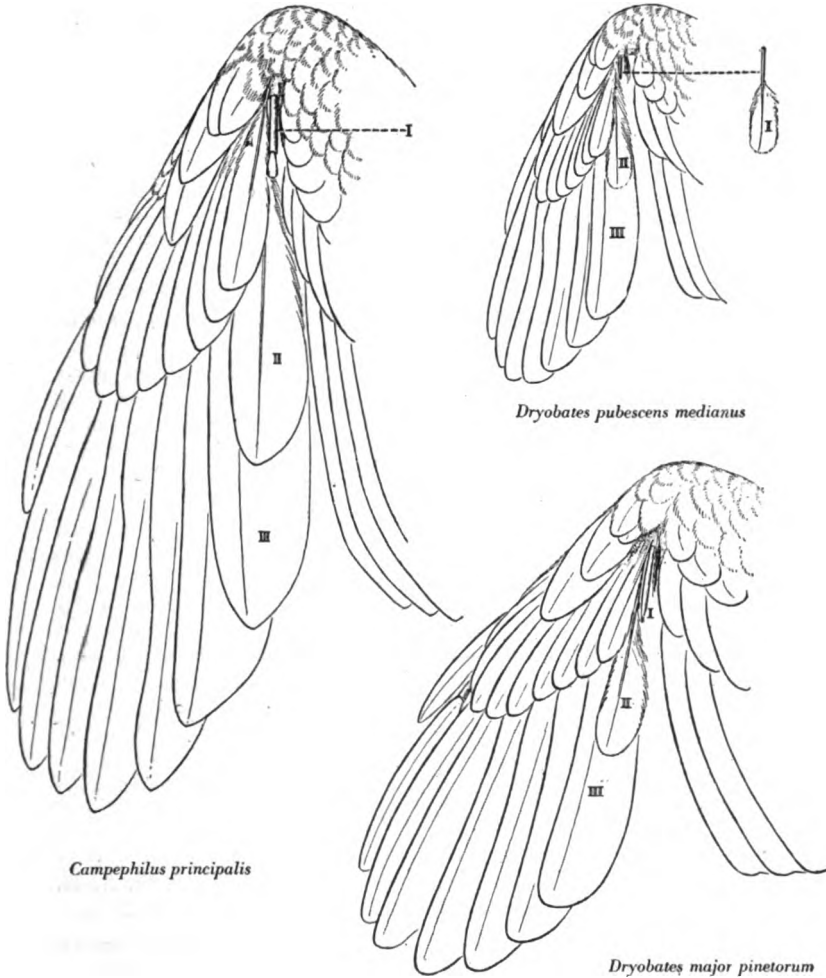


Fig. 5. Wings of nestling woodpeckers from above (A) $\times \frac{1}{2}$. (B. & C.) $\times \frac{3}{4}$.

Balanosphyra formicivora aculeata (Mearns).

Fig. 4 A is from a half-grown nestling (♀), Pinal Co., Arizona, July

30, 1884, A. M. N. H., No. 29464. The length of wing is only 72 mm., as against 139 mm. for the adult. There are clearly two dwarf primaries, for although No. I is still entirely enclosed in the sheath, No. II has attained its full growth, with calamus at base, measuring only 18 mm. in length. The second primary in an adult is 85 mm. long.

Campephilus principalis (Linnaeus).

Fig. 5A was drawn from a young ♀, with wings nearly full-grown, from Old Town, Florida, Apr. 15, 1892. Wm. Brewster Coll. No. 42972. Length of wing 210 mm. (ad. l. 254).

All the primaries still have sheaths except Nos. II, III, and X. There are two reduced inner primaries, perhaps even three, for No. III, fully developed, measures only 131 mm. (ad. l. 170). No. II is markedly shortened, 91 mm. long, whereas the same feather in an adult female measures 155 mm. No. I is just coming in, measures only 19 mm., and is almost entirely covered by its sheath. In view of its late appearance it seems doubtful whether this is the juvenal feather.

In any event it is clear that there must be a marked reduction of the two innermost primaries during nestling life. It appears to be very probable that a slight reduction of No. III is of common occurrence in species where I and II are greatly abbreviated. This is not always easy to determine, for at the age where the shortest primaries are best examined, No. III is apt not to be fully grown, and thus difficult to compare with the adult size.

Campephilus pollens pollens (Bonaparte).

A young female from La Florida, Colombia, July 11, 1911, A. M. N. H., No. 109580, has the wing fully grown, 174 mm., and all the primaries out of the sheath except No. I, which is just growing in, and measures 48 mm. This may or may not indicate that there was a small first primary at an earlier stage, but it does show that primary II was never reduced.¹

Another specimen of the same sex (♀), Cocal, Colombia, June 10, 1911, A. M. N. H., No. 109586, must be a little older. Primary I has attained its full length of 126 mm. and No. II is just coming in, showing that this species undergoes the usual post-juvenal molt.

Campephilus malherbei Gray.

A young male, from Noanamá, Colombia, Dec. 31, 1911, A. M. N. H.

¹ The American Museum has since received a younger specimen of *C. pollens*, apparently a male, from Cauca, Colombia, which shows the first juvenal primary in place. Its wing measures 161 mm. (ad. l. 174), and the longest primaries are practically complete. There is considerable reduction of the first primary, for it is 34 mm. shorter than the adjoining first secondary, and although fully grown, measures but 96 mm. as compared with 135 in an adult (a shortening of nearly one third), the second juvenal primary is only very slightly reduced, 113 mm. (ad. l. 140) and the third primary hardly at all.

No. 111840 has all the primaries full grown except I. Length of wing, 170 mm. Primary II of the juvenal plumage is not reduced in size; it would appear that the primary I now growing in (60 mm. long) is that of the "first winter" plumage. This assumption seems justified, because the first primary of the juvenal plumage is generally completely grown before the longer quills of the same series. Whether the juvenal first primary is reduced or not cannot be demonstrated.

Campephilus haematogaster (Tschudi).

A young female, from Zamora, Ecuador, Nov. 1, 1913, A. M. N. H., No. 129623, has its wings full grown (length 185 mm.), but primary I, though well grown, still retains a basal sheath, and is certainly the "first winter" quill. What the first juvenal quill was like we cannot say, but certainly No. II of the juvenal series is not reduced.

Melanerpes erythrocephalus (Linnaeus).

Three young specimens were examined, with wings so short that they must have been taken from the nest. In each case primary No. I was small, and in the sheath, but we can be almost sure it is not the juvenal quill.

The youngest in the American Museum, No. 61231, Custer Co., South Dakota, July 10, 1893, has the wing about 108 mm. (ad. l. 140 mm.). None of its primaries except the outermost (X) is full-grown, all the others have sheaths at the base, and No. II is not appreciably reduced, already 70 mm. long. Yet No. I is still only 5 mm. long, entirely enclosed in a sheath. Conditions are exactly the same in both wings. There is a great probability that the juvenal first primary has already been shed, but in no other species examined save *Centurus carolinus* and *Dryobates pubescens* has this been seen to take place so early.

Two young in Dr. Dwight's collection, with wings of 97 and 104 mm. in length, likewise show, the first primaries in their sheaths, 12 and 18 mm. long. (See Fig. 6B.)

Another young bird in the American Museum (Aug. 20) has the renewed first primary, presumably of the "first winter" plumage, already growing in. Other young taken in September show that primaries II to X are not molted at once, since I can be distinguished by its fresh black color. The post-juvenal molt of the wing-quills, in this species, takes place only toward December, so there is no close sequence between the molt of the first primary and of the others.

Centurus carolinus (Linnaeus).

Two young birds (♂), with longest primaries not quite full-grown, taken at Seven Oaks, Fla., May 20 and 22, 1912, coll. J. Dwight, Nos. 32099, 32100. In both cases the length of wing was 110 mm. (ad. l. 131 mm.). Primaries II and III were full-grown, and about of adult length,

but in both birds I was a small feather, 9 and 17 mm. long, entirely enclosed in the sheath. This is exactly like the condition in *Melanerpes erythrocephalus*, and I was unable to say whether or not the juvenal feather has already been shed until I examined a much younger bird, a female, about one-half grown, in the Museum of Comparative Zoology, No. 43447. Its wing measured 62.5 mm., and all the primaries were still sheathed at their base, even No. I. The latter was therefore not quite fully grown, but measured 24 mm., and was of soft texture, and much narrowed, only 4.5 mm. wide at its broadest part. Here then was the reduced juvenal primary we sought. No. II showed no sign either of narrowing or of shortening.

Centurus striatus (Müller).

A young female from Sanchez, Santo Domingo, March 3, 1907, A. M. N. H. No. 102072, had the wing 110 mm. long (ad. l. 117 mm.), and yet had not been long out of the nest. The innermost primary is just coming in, and already 66.5 mm. long, while the second measures 77 mm. There is no reduction of No. II; but it seems practically certain that No. I is now the first-winter feather, its juvenal predecessor being early lost, as in *Centurus carolinus*.

Hypoxanthus rivolii brevirostris Tacz.

One young bird, about two-thirds grown, from Southern Ecuador, in A. M. N. H. Its wing measures 93 mm. (ad. l. 132 mm.); all primaries are still in the sheath except No. I which is full grown, but only 38 mm. long, whereas No. II has already reached a length of 66 mm. and is still growing. The latter is clearly not reduced in size.

Campethera permista (Reichenow).

Fig. 6D from a nestling (♂), Medje, Ituri District, Belgian Congo A. M. N. H. No. 159466. All the longer primaries still have sheaths at the base; length of wing 80 mm. (ad. l. 96 mm.). Primary II not shortened but No. I extremely reduced, its full length only 18 mm. (ad. l. 71 mm.). Yet the greater upper covert of No. I is of normal size.

Campethera nivosa herberti (Alexander).

Fig. 4B taken from nestling (♀). Medje, Belgian Congo, A. M. N. H. No. 159500. Larger primaries still growing, length of wing 66 mm. (ad. l. 83 mm.). The first primary, which has reached its full length, is the only one of reduced size; it measures 25 mm. (ad. l. 63 mm.).

Chrysopicos punctatus balius* (Heuglin).

Fig. 6C is drawn from a nestling in spirit, taken at Faradje, Upper Uele District, Belgian Congo. Length of wing, 78 mm. (ad. l. 107 mm.). Second primary not appreciably shortened, but first only 27 mm. long, though fully grown (ad. l. 74 mm.).

* This genus is recognized upon the advice of Mr. W. DeW. Miller.

The same reduction of the innermost primary is seen in every one of a series of six nestlings of both sexes, the greatest length attained being 35 mm., or less than one-half the adult size.

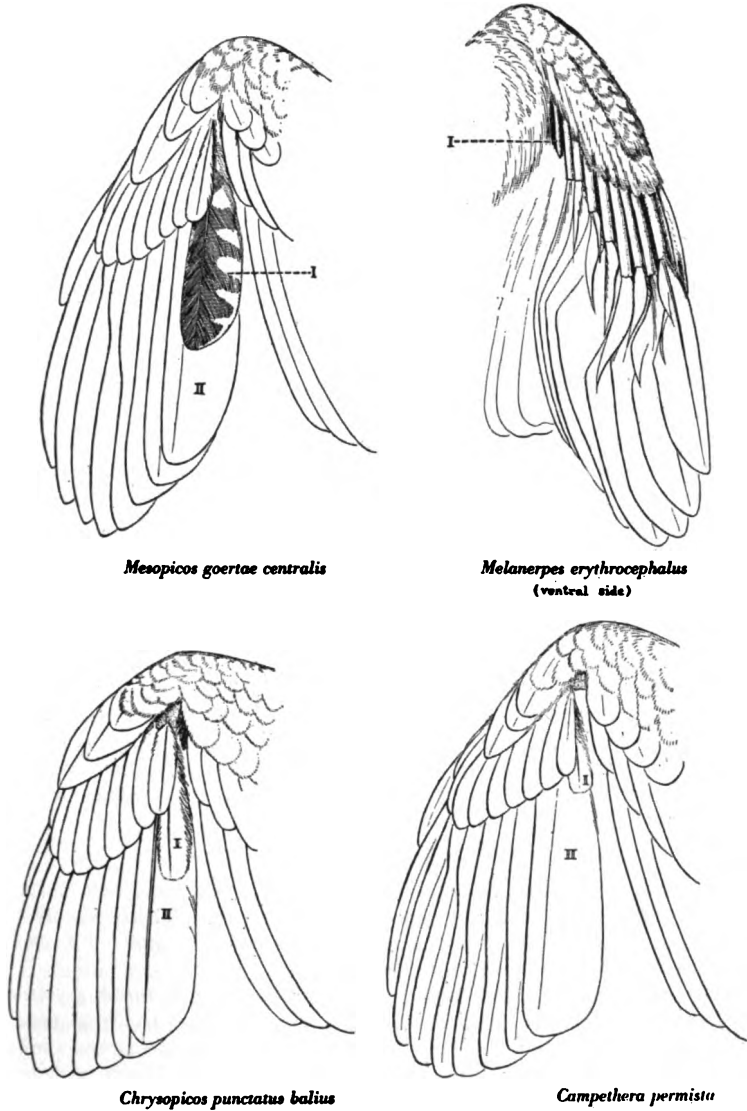


Fig. 6. Wings of nestling woodpeckers. $\times \frac{3}{4}$.

It will be seen from the drawing of this species that the carpal remex is completely wanting, as it is also in *Campelthera permista*, *C. nivosa herberti*, and *Leuconerpes candidus*. A vestigial, downy carpal remex is present, however, in *Dendropicos poecilolaemus*, as it is in most other Woodpeckers, being shown in several of the drawings, viz. of *Picus viridis viridis*, *Colaptes auratus luteus*, *Dryobates major pinetorum*, *Ceophloeus lineatus similis*, and *Balanosphyra formicivora aculeata*.

Dendropicos poecilolaemus Reichenow.

A fully fledged young female, from Aba, Upper Uele District, Belgian Congo, A. M. N. H. No. 159512, had wings measuring 74 mm. (ad. l. 83 mm.). Only the first primary was dwarfed, measuring 20.5 mm. (ad. l. 60 mm.).

Its color pattern is seen to be distinctly unlike that of an adult feather (Fig. 1); and it may be said that in general, the greater the reduction the more apt is there to be a difference of pattern.

Meiglyptes grammithorax (Malherbe).

A young bird from Borneo, U. S. Nat. Mus., No. 182835, is nearly full grown, wing 77 mm. (adult length 90 mm.). Only primaries VII and VIII still have traces of sheaths at their base. No. I alone is reduced, it is narrow and just 30 mm. long, in the adult it would measure 65 mm.

Xiphiopicus percussus percussus (Temminck).

A rather young nestling (♂) from Cuba, U. S. Nat. Mus. No. 172584, has a wing of only 65 mm. (ad. l. 120 mm.). All the primaries have basal sheaths, including even No. I, which is, however, nearing its full growth, and still only 29 mm. long, being distinctly narrowed, besides. (ad. l. 90 mm.). No. II shows no reduction, either in length or in width.

Tiga javanensis (Ljung).

A large nestling from Depok, Java, U. S. Nat. Mus. No. 219317, has the wing 106 mm. long (adult length = 138 mm.). All its primaries have sheaths at the bases except No. I, which is fully grown, but rather narrower than II, and only 47 mm. long (ad. l. 97 mm.). There is evidently no reduction of No. II, which is already 67 mm. in length.

Mesopicos goertae centralis Reichenow.

A nestling (♂) from Faradje, Belgian Congo, Am. Mus. Nat. Hist. No. 159530, has the wings 90 mm. (ad. l. 110 mm.). All its primaries are still growing out of sheaths except No. I, which has completed its development, and measures 43 mm. (ad. l. 75 mm.). Its color pattern is very similar to that of II and other inner primaries. (See Fig. 6 A.)

Here there is only moderate reduction of but one primary, so the char-

acter is intermediate between conditions in *Chrysopicos* and in a form like *Leuconerpes* showing no reduction.

Chrysophilus melanolaemus (Malherbe).

A rather large nestling was examined from Pulque, Prov. Sucre, Bolivia, Am. Mus. Nat. Hist. No. 139154. All primaries still in the sheath, including No. I, which though narrower than No. II and evidently somewhat stunted, is already 67 mm. in length (adult length = 107 mm.). There is thus only a slight reduction of a single inner primary, and a condition intermediate between that in *Mesopicos goertae*, for example, and in *Leuconerpes candidus*. This is confirmed by a second specimen from the same brood.

Leuconerpes candidus (Otto).

A well-developed nestling, from Matto Grosso, Brazil, Am. Mus. Nat. Hist., No. 34293, shows very clearly that there is no reduction in length of the inner primaries. Only primary X is full grown; the others have still a slight basal sheath, yet I and II have nearly the same relative proportions as in the adult. Length of wing 131 mm. (adult length 162 mm.); primary I, 79 mm. long (adult length 94 mm.); primary II, 86 mm. (adult length 100 mm.). The inner primaries are somewhat narrower than in the adult.

Asyndesmus lewisi Riley.

A young female from La Plata Co., Colorado, July 8, 1892, in A. M. N. H. has the wing 150 mm. long (ad. l. 169 mm.). All the primaries except X still have sheaths at the base, but there is no shortening or narrowing of any of the inner primaries. No. I already measures 92 mm. and is still growing.

Another young bird from British Columbia has the wing full grown, 164 mm., but there is no sign either of reduction of the inner primaries or of a beginning of post-juvenal molt. So the juvenal inner primaries are of full size as in the Sapsuckers, to which Lewis's Woodpecker is by no means closely related.

Sphyrapicus varius varius Linnaeus.

A nestling from Delaware Co., N. Y., Am. Mus. Nat. Hist., No. 65251, with wing already 88 mm. long (adult length 124 mm.) has all its primaries except X still in the sheath, yet I and II bear about the same relation to their fellows as they would in the adult. No. I is already 58 mm. long (adult length 70 mm.).

In this specimen, as well as in nestlings of *S. v. nuchalis* and *S. thyroideus*, there seems to be something peculiar about the growing base of primary VI of the juvenal series. Its tube or sheath is noticeably slenderer than those adjoining on each side, and appears to break away more quickly, yet the fully developed feather shows no resultant peculiarity.

This is the single quill that grows on the phalanx of the third digit of the manus. No such peculiarity was noted in any other woodpecker, not even *Leuconerpes*.

Sphyrapicus varius nuchalis Baird.

A nestling from Boulder Co., Col., U. S. Nat. Mus., No. 84310, with primaries still in the sheath, shows large first and second primaries.

Sphyrapicus ruber ruber (Gmelin).

A nestling (♂) from Fort Klamath, Ore., July 14, U. S. Nat. Mus. No. 558, shows no reduction of primaries I and II.

Sphyrapicus thyroideus (Cassin).

Two nestlings from Colorado (♂ and ♀), U. S. Nat. Mus., Nos. 84321 and 84322 have wings 78 and 84 mm. long (adult length 136 mm.) respectively. Both have primary I well developed, and about as long as No. II, agreeing thus with the young of *S. varius*.

PROBABLE SIGNIFICANCE.

Having demonstrated the frequency and diversity of this unusual character among nestling woodpeckers, let us consider its possible interpretation. Does it repeat any previous stage in evolutionary development? Probably not. It seems beyond question that the woodpeckers have originated from a line of descent more like the barbets than any other living group, and the Capitonidae show no reduction of the inner primaries either in the adult or in the young, certainly not in the several genera, *Heliobucco*, *Tricholaema*, *Buccanodon*, and *Lybius*, which I have carefully examined. Furthermore, reduction in the size or number of primaries, in all the higher groups of birds, seems to have taken place at the distal, not the proximal end of the primary series.

A clear case of "recapitulation," for example, may be seen in the 10th (outermost) primary of many Picidae, which is conspicuously longer in the juvenal plumage than it is in the adult. Perhaps the best illustration—pointed out to me by Mr. W. DeW. Miller—is offered by the sapsuckers (*Sphyrapicus*), where the wing-tip is exceptionally long and pointed, and the 10th primary of the adult unusually small. In the first plumage the corresponding feather is approximately 66 per cent. longer, as well as much wider, than in the parents' wing. (See fig. 3.) This indi-

cates that the quill in question was better developed in the ancestral forms, and supports the prevailing view that the number of primaries, and the size of the outer one, have undergone reduction in the Passeres, Pici, and other specialized groups of birds.

So far as we know, then, or can surmise, the diminished size of the young woodpeckers' inner primaries does not represent any earlier stage in the ancestral history of this extremely specialized family. We are more inclined to look upon this condition as fitting the young woodpecker for some nest-dwelling exigency, and comparable, in a way, to the rasp-like heel-pad of young barbets and toucans, which likewise disappears before adult life. But why, it might be asked, do not other young birds reared in cavities of trees possess this same character? I can only answer that the Picidae exhibit a number of striking adaptations to a life spent climbing upon the bark of trees, such as their chisel beak, resistant skull, barbed, extensile tongue, and stiffened, pointed rectrices, which are wanting, in part at least, among all the other groups of birds that have adopted similar modes of life, namely the Dendrocolaptidae, Sittidae, and Certhiidae. This is only one more case where the Picidae lead.

For a while we were unable to suggest any need or advantage for a gap in the wing-feathering at the carpus, especially as the first secondary is in no wise affected by this circumstance.

The shortening of these primaries is of course effected by the premature arresting of the growth of the feather, the dwindling of the barbs and the formation of a normal calamus or barrel. This is exactly the same process that determines the length of any ordinary contour-feather, and what the immediate causes are seems not very readily explained. They may be concerned with blood supply, and histological study of the normal feather papilla as compared with those of powder-down feathers, or of the plumes of Japanese long-tailed fowls, might reveal something. This is a matter of considerable interest, in view of the extreme accuracy with which it is timed, so as to allow of little variability in a primary-formula, for example, or of wing-length which is a universally accepted standard for any given species, and which usually gives a real scientific basis for the so-called "millimeter race."

In this particular case of the young woodpecker, it might be ascribed to imperfect nutrition of this region of the wing, but it is only one or two quills that are affected, whereas the adjoining coverts would be expected to share in this starvation. It was felt that such an exceptional condition would hardly have been perpetuated unless some selective value could be attributed to it.

A hypothesis offered by Mr. J. T. Nichols, when he heard of these facts, is of decided interest. A gap in the wing, he argued, would allow the young birds with less difficulty to stick up their heads to be fed, in the cramped quarters of the woodpecker nest.

To be sure, should such a condition arise, it would not immediately benefit the bird possessing it so much as its nestmates, consequently this might make an explanation less plausible on the basis of natural selection. On the other hand were the parents bearers of a hereditary factor that would bring out the wing character in all their young, we might assume that all the nestlings would benefit by a more equable share of the food, thus assuring a more numerous progeny.

Whatever the explanation, Mr. Nichols pointed out to me that there is already direct photographic evidence supporting this theory in a motion-picture taken by Dr. T. S. Roberts and Mr. Jenness Richardson of the University of Minnesota, which was exhibited at the meeting of the American Ornithologists' Union in 1916. This film shows the young flickers being fed at the entrance to their nest. The old bird is clinging to the bark outside; two young birds are leaning well out of the opening, begging for food. One of them has a wing out of the hole, and very much in the way of its companion's open beak. The difficulty is speedily overcome by nestling No. 2, which pokes its head and neck through the wing just between the primaries and secondaries, right at the gap under discussion; and they hold this position for some little time. This is clearly shown by Plate XIX, which is taken from this instructive and timely film.

Why young sapsuckers should differ from the majority of young Picidae is a question I cannot answer for the present, but gladly leave to the curiosity of field ornithologists. They cannot fail to find here an inviting point for elucidation; indeed the young of any of the woodpeckers will be well worth careful observation.

The systematic ornithologist, on the other hand, will be anxious to see what use can be made of this new character in arranging the lesser groups within the family of woodpeckers. It is not common to the whole of the Picidae, and might lead us therefore to segregate the sapsuckers, as Dr. Coues once did, in a separate



Fig. 7. Key to plate XIX. fig 2: P. primaries, S. secondaries of young bird No. 1.

subfamily. Yet in almost all their external characters the species of *Sphyrapicus* are close to *Dryobates*, with which they have recently been placed by Mr. Ridgway in the same super-generic association.* Moreover there are other genera, like *Asyndesmus*, *Leuconerpes* and *Chrysoptilus*, showing no very small inner primaries, and yet utterly unlike *Sphyrapicus* in other structural characteristics. It would seem then that large-sized inner primaries, among young woodpeckers, rather than constituting a primitive heritage, were re-acquired, secondarily and perhaps

* Birds of North and Middle America, VI, 1914, p. 10.

independently, by members of several different groups. This would detract greatly from the usefulness of such a feature for purposes of classification.

It is possible, nevertheless, that the number of primaries reduced, whether two or only one, may indicate an affinity between various species or even genera. At all events, in spite of the very evident adaptive nature of such a character, it is one additional point to be considered in the weighing of relationships.

At least two very different species of *Campethera*, and one each of *Chrysopicos*, *Dendropicos*, *Mesopicos*, *Tiga*, *Meiglyptes*, one of *Hypoxanthus* and *Xiphidiopicus* agree in having but a single inner primary reduced; whereas the Green, the Downy, the Hairy, the Great Spotted, the White-headed, and Mearns' Woodpeckers, the Flicker, and a Mexican Pileated Woodpecker agree in the presence of two such stunted feathers. Yet the Red-headed and Red-bellied Woodpeckers, which are often considered as congeneric with Mearns' Woodpecker, are found to have but a single small feather, at most. And so two other genera, *Asyndesmus* and *Leuconerpes*, likewise believed to be nearly related to *Melanerpes*, agree with *Sphyrapicus* in the well-developed first and second primaries of their young.

It is probable that within the *Dryocopus* group some of the genera will show one small primary, others two, as in *Ceophloeus lineatus*. The same thing has already been established for the "Ivory-bill" group (*Campephileae* of Ridgway) where *Campephilus principalis* shows two, and three other species of doubtful generic distinctness not more than one.

I may state that Mr. W. DeW. Miller, who has recently been making a very thorough investigation of the supergeneric groups of woodpeckers, and has given me every assistance in the preparation of this paper, cannot find any correlation between the present character and the important structural features which mark them otherwise. He is of the opinion that the piculets form a distinct family from the typical woodpeckers, and thus far we have been unable to discover in the Picumnidae any evidence

either of a post-juvenal molt or of juvenile reduction of an inner primary.

The majority of the species which we have shown to possess but a single dwarfed primary will be seen to have a more or less tropical distribution, while those with two are in general of more northern climes. Whether this is a general rule we cannot say as yet; in any case it appears to possess little significance, since *Sphyrapicus*, with no reduction, is a distinctly northern group, at least with regard to its breeding range.

SUMMARY.

In many different genera of woodpeckers, the first, or the first and second (inner) primaries of the juvenal plumage attain but a fraction of the normal size in the adult. They are, however, quickly replaced, at the very beginning of the early post-juvenal molt so characteristic of the Picidae, by quills not differing greatly in length from the adjacent primaries and secondaries. Even where the post-juvenal molt is delayed, the reduced primary is rapidly shed and renewed. No difference could be discovered between the sexes with regard to the size or molt of these feathers. The genera *Sphyrapicus*, *Asyndesmus*, and *Leuconerpes* and possibly others, offer an exception to the rule, having no dwarfed inner primaries. The condition of these feathers of the nestlings, in all species thus far examined, is indicated in the following table.

Reduction of Inner Primaries in Species studied thus far.

Shortening of two	{	Ceophloeus lineatus
		Dryobates major
		Dryobates villosus
		Dryobates pubescens
		Xenopicus albolarvatus
		Colaptes auratus
		Picus viridis
		Balanosphyra formicivora
		Campephilus principalis

	Campephilus pollens	
	Campephilus malherbei	
	Campephilus haematogaster	
	Melanerpes erythrocephalus	
	Centurus carolinus	
	Centurus striatus	
Shortening of one	Hypoxanthus rivolii	
	Campethera permista	
	Campethera nivosa	
	Chrysopicos punctatus	
	Dendropicos poecilolaemus	
	Meiglyptes grammithorax	
	Xiphidiopicus percussus	
	Tiga javanensis	
	Mesopicos goertae	
Narrowing, but little shortening	} Chrysophilus melanolaemus	
No reduction	{	Leuconerpes candidus
		Asyndesmus lewisi
		Sphyrapicus varius
		Sphyrapicus ruber
		Sphyrapicus thyroideus

The value of this character in revealing the affinities of the various groups within the family is very doubtful. It is probably an adaptation of some utility during early life in the limited space of the nesting hollow, perhaps as suggested by Mr. Nichols, enabling the young birds while being fed to raise their heads through one another's wings, there being indeed photographic grounds to uphold this theory in the case of young Flickers.

American Museum of Natural History, New York.

BREEDING BIRDS OF WARLAND, LINCOLN CO., MONTANA.

BY THOMAS D. BURLEIGH.

WARLAND lies on the Kootenai River and is but a small town which owes its existence to the saw mill of the Baird-Harper

Lumber Co. It is the only town of which I have any knowledge from which there are no roads leading elsewhere. Automobiles are unknown and if one wishes to travel, walking is the only possible way except by the Great Northern Railroad. About the town there is a little open land, but the surrounding country is, with the exception of the slashing which extends for eight miles up the Cripple Horse Creek, largely covered with timber. This, on the south slope of the mountains, is western yellow pine and, as is characteristic where this species predominates, the woods are open and comparatively free from underbrush. The north slopes are covered with Douglas fir and western larch, and here the stands are thicker and underbrush is more prevalent. The mountains about the town are comparatively low in elevation, ranging in altitude from 4500 ft. to 6000 ft.

I spent the summer of 1920 in a logging camp on the Cripple Horse Creek, which I found well situated for field work. During the week I covered the slashings about the camp and the untouched timber which lay farther up the valley. My Sundays were spent in walking to Warland and working the open country there. Cripple Horse Creek is but a small stream which during this past dry summer almost completely dried up. Where it flows into the Kootenai River the valley is wide but a few miles above the camp it gradually narrows and finally forms a steep rugged gorge.

As I reached Warland late in May, I of course missed those species which breed earlier but I was in time for the bulk of the birds which prefer June in which to rear their young, and while my list is undoubtedly far from complete it will give a fair idea of summer bird life in northwestern Montana.

Actitis macularia. SPOTTED SANDPIPER.—This was a common summer resident along the Kootenai River. The last bird for the year was seen September 7.

Oxyechus vociferus. KILLDEER. This bird breeds rarely if at all for but one was seen, June 29, feeding at the edge of a field.

Dendragapus obscurus richardsoni. RICHARDSON'S GROUSE.—A scarce breeding bird, found well up the mountain sides.

Bonasa umbellus togata. CANADA RUFFED GROUSE.—A common bird of the valleys. Accustomed as I was to the birds of the east, the lack of fear shown by this species was of never failing interest to me. When one was approached it would run along the ground for a few feet and then slow down to a walk repeating this until it tired when it would

fly into a nearby tree and "cluck" angrily. A female found with newly hatched young on July 2 proved actually pugnacious, charging directly at me as I stood watching her, feathers puffed out and tail spread, uttering a low hiss and a peculiar whine, and coming within a foot of me before turning and walking slowly off to a safe distance.

***Zenaidura macroura marginella*.** WESTERN MOURNING DOVE.—I have but one record for the occurrence of this species, one bird being seen in a slashing on June 15.

***Cathartes aura septentrionalis*.** TURKEY VULTURE.—This species was of irregular occurrence here during the summer months but it very probably breeds. The first bird was seen June 29, soaring low overhead, and one was seen as late as Sept. 10.

***Accipiter velox*.** SHARP-SHINNED HAWK.—Scarce and seen at infrequent intervals in the valley.

***Buteo borealis calurus*.** WESTERN RED-TAIL.—A common summer resident. A nest found June 17 held two half grown young and was eighty feet from the ground in a large larch well up the mountain side. It was massive and evidently had been used before, and was built of sticks with a lining of fresh sprays of Douglas fir. The well picked bones of probably a rabbit were lying at the edge of the nest.

***Falco sparverius phalaena*.** DESERT SPARROW HAWK.—A common bird in the slashings and in the open spots along the Kootenai River. One nest found July 18 with well grown young was fully a hundred and twenty feet from the ground in a cavity in the top of a large dead larch in an open slashing.

***Bubo virginianus pallescens*.** WESTERN HORNED OWL.—Near midnight on July 31 one bird called for some time from the woods at the edge of the logging camp and on August 22 one was flushed from the top of a tall slender larch in the valley.

***Ceryle alcyon alcyon*.** BELTED KINGFISHER.—A summer resident along the river. A nest found June 15 held seven well incubated eggs and was in four feet in a low bank facing the river.

***Dryobates villosus monticola*.** ROCKY MOUNTAIN HAIRY WOODPECKER.—This species proved to be very plentiful in the open slashing between Warland and the logging camp. Lumbering had undoubtedly been a big factor in causing an increase in the number of these birds here for in the untouched timber farther up the valley they were rarely seen. Two nests found June 1 held noisy young.

***Dryobates pubescens homorus*.** BATCHELDER'S WOODPECKER.—Unlike the last this species was decidedly scarce and seldom seen.

***Picoides arcticus*.** ARCTIC THREE-TOED WOODPECKER.—A fairly common bird in the open slashings. A nest was found June 7 with well grown young, nine feet from the ground in the trunk of a dead Douglas fir in the middle of a slashing.

Picoides americanus fasciatus. ALASKA THREE-TOED WOODPECKER.—While not as plentiful as the last, this species was still far from scarce and showed a like preference for the open slashings. A nest found June 12 held three slightly incubated eggs and was eight feet from the ground in the trunk of a dead but still solid larch in the middle of a slashing in the valley. The male bird was incubating and flushed easily, but was quiet and showed little concern over its nest. Another nest found the same day held small young and was five feet from the ground in the trunk of a tall slender dead larch.

Sphyrapicus varius nuchalis. RED-NAPE SAPSUCKER.—A fairly common summer resident in the open pine woods, avoiding largely the slashings. A nest was found May 31 with five fresh eggs, forty feet from the ground in the trunk of a large living larch a short distance up the mountain side. The male bird was incubating and as is usually the case with this sex it flushed easily at the first rap on the tree.

Sphyrapicus thyroideus. WILLIAMSON'S SAPSUCKER.—A very scarce summer resident. To the best of my knowledge but one pair of these birds bred about Warland. The nest when found June 12 held small young and was fifty feet from the ground in the trunk of a large living larch at the edge of a slashing in the valley. After the young had flown this species was not recorded again until September 5, when one bird was seen in the open woods well toward the top of one of the mountain ridges.

Phloeotomus pileatus abieticola. NORTHERN PILEATED WOODPECKER.—A common bird in the valley and in the scattered ravines. During the summer months few were seen but toward the middle of September this species suddenly became much in evidence and the sight of one flying by overhead or feeding on an old log at the side of the trail was a common occurrence. At this time they were also rather noisy, their loud cackle being one of the first sounds heard at dawn and the last at dusk. One thing which interested me was the ease with which I could walk up to them. At one time I came across two feeding on an old rotten log lying on the ground and I was able, with a little care, to walk up within twenty feet of them and sit down and watch them for fully half an hour. This was a feat never dreamed of in Pennsylvania where I first became acquainted with this bird.

Asyndesmus lewisi. LEWIS'S WOODPECKER.—This was a fairly common summer resident in the open slashings in the valley. Four nests were found but all were inaccessible, being in the tops of the largest rottenest stubs. The lowest was sixty feet from the ground while two were fully a hundred feet up, in stubs three feet in diameter at the base and with all the bark gone.

Colaptes cafer collaris. RED-SHAFED FLICKER.—Wherever there was any open country this bird was sure to be found. A nest found May 29 held seven well incubated eggs and was but four feet from the

ground in an old stump in the middle of an open field. Others seen later with young were higher than this, ranging from ten feet to fully eighty feet up in one case.

Chordelles virginianus hesperis. PACIFIC NIGHTHAWK.—The first birds were seen June 4, two feeding toward dusk high overhead. They soon became plentiful in the slashings in the valley and it was here that the one nest was found. On July 2 a female was flushed from two fresh eggs lying on the bare ground close to a large Douglas fir at the edge of a slashing. On September 3 one bird was seen for the last time, flying silently by overhead.

Chaetura vauxi. VAUX'S SWIFT.—I have but one record for the occurrence of this species here. On August 20 six birds were seen, flying by low overhead in the valley.

Stellula calliope. CALLIOPE HUMMINGBIRD.—This was a fairly common summer resident in the open woods in the valley. A nest found June 1 held two slightly incubated eggs and was eight feet from the ground on a small horizontal dead limb close to the trunk of an alder overhanging a small stream in a ravine. It was composed largely of soft white plant down, with a few dry pine needles at the base, and covered externally with lichens.

Tyrannus tyrannus. KINGBIRD.—Although a plentiful summer resident about the town of Libby, twenty miles west of Warland, but one pair of birds bred at Warland. The nest when found July 7 held three well incubated eggs and was sixty feet from the ground in a tall slender larch in a clearing at the edge of the town. It was built of gray plant fibres, weed stems and grasses, lined with fine grasses. The last record for the year was August 9, one bird being seen at the edge of a slashing.

Nuttallornis borealis. OLIVE-SIDED FLYCATCHER.—A fairly plentiful summer resident about slashings and clearings in the valley. The last bird for the year was seen August 10.

Myiochanes richardsoni richardsoni. WESTERN WOOD PEWEE.—A scarce summer resident in the open slashings in the valley. A nest found June 21 held three incubated eggs and was twenty feet from the ground in a horizontal crotch of a small dead and somewhat bent larch in the middle of a burnt-over slashing. It was shallow but compactly built, of gray plant fibres, grasses and strands of brown moss, lined with fine grasses and feathers. Another found July 1 with three slightly incubated eggs was twenty feet from the ground in a horizontal crotch of a dead limb of a birch at the edge of a field. It was built of gray plant fibres, strips of bark and grasses, lined with fine grasses and considerable wool, the outside being sparingly covered with lichens. A third found July 4 held three slightly incubated eggs and was twenty-five feet from the ground in a horizontal crotch of a dead and somewhat bent alder at the edge of a thicket in the middle of a slashing. Like the others it was shallow but

compactly built, of gray plant fibres, grasses, strands of brown moss and, on the outside, a very few lichens, lined with brown moss and a few grasses.

Empidonax hammondi. HAMMOND'S FLYCATCHER.—This was an abundant summer resident and was found anywhere and everywhere, in the open country about the town, in the slashings, in the open woods in the valley and well up the mountain sides. In nesting it showed no preference for any special site and the situations chosen varied widely. In all I found ten nests, as follows:

No. 1. On May 29 a bird was seen working on a nest sixty feet from the ground at the outer end of a limb of a large yellow pine at the edge of a stretch of woods. I never had the opportunity to return to it so my data for it are meager.

No. 2. A nest found June 8 held four fresh eggs and was thirty feet from the ground near the top of a slender birch at the edge of a thicket in a slashing. It was made of gray plant fibres, grasses, strands of moss and strips of bark, lined with feathers from a Hairy Woodpecker and a few horse hairs.

No. 3. June 9, four fresh eggs, thirty feet from the ground at the extreme outer end of a limb of a large larch in open woods part way up the mountain side, made of plant fibres, grasses, strips of bark, moss and a few feathers, lined with deer hair and a little horse hair.

No. 4. June 10, four fresh eggs, fifteen feet from the ground at the outer end of a lower dead limb of a lodgepole pine at the side of the stream in the valley, made of plant fibres, strips of bark, grasses, gray moss, bits of fur and a little wool, lined with several small dead leaves, bits of fur and fine porcupine hair.

No. 5. June 11, four fresh eggs, eight feet from the ground in a small Douglas fir at the edge of a thicket bordering an open field, made of plant fibres, a few grasses, moss and plant down, lined with down, a few horse hairs and, largely at the bottom, soft bud scales.

No. 6. June 13, three slightly incubated eggs, six feet from the ground in the top of a bush, in a small clump of bushes at the edge of a clearing on the mountain side, neat and compact, of gray plant fibres and grasses, lined largely with small yellow feathers and a few grasses.

No. 7. Another nest found the same day held one fresh egg and was four feet up in a small bush, in a clump of bushes growing in a crevice of a cliff fully sixty feet from the ground. It was roughly built of gray plant fibres and down and was seemingly unlined.

No. 8.—June 20, four fresh eggs, six feet from the ground in a bush on an open rocky hillside, well built of gray plant fibres, lined with soft shreds of inner bark and plant down.

No. 9. June 25, four slightly incubated eggs, twelve feet from the ground in a small Douglas fir in a thicket at the edge of a field, made of plant fibres and grasses, lined with plant down, horse hair and soft bud scales.

No. 10. July 7, three slightly incubated eggs, ten feet from the ground in a sapling in the underbrush bordering the Kootenai River, made of plantfibres, grasses and feathers, lined with horse hair and soft bud scales.

Toward the middle of August the birds began to become scarce and on September 3 the last one for the year was seen.

Pica pica hudsonia. MAGPIE.—Although this bird did not breed in the vicinity of Warland it must nest close by for, appearing toward the latter part of August, it soon became fairly plentiful and small flocks were of common occurrence.

Perisoreus canadensis capitalis. ROCKY MOUNTAIN JAY.—A fairly plentiful resident. Secretive and shy until the young were well grown. The first birds were not seen until July 21 when three were found feeding in the larger trees near the top of the mountain behind the camp. From that date on they gradually became more plentiful and by the first of September small flocks were seen almost daily.

Corvus corax sinuatus. RAVEN.—This bird was a fairly plentiful resident and there were few days when one or two were not seen. They showed little fear of man and fed indiscriminately about the town and at the edge of the logging camp. A nest which had seemingly been used the past spring was found during the summer on a ledge of a cliff well up the mountain side at the edge of the Kootenai River.

Nucifraga columbiana. CLARK'S NUTCRACKER.—It was August 9 before I saw my first one of this species but once they began to come out of their retirement it was not long until they were quite common. They showed no hesitation in coming down into the valleys and small flocks were frequently seen in the open slashings between the camp and Warland.

Molothrus ater ater. COWBIRD.—Although scarce about Warland and seldom seen there, this bird was very plentiful in and about the town of Libby, some twenty miles farther west.

Sturnella neglecta. WESTERN MEADOWLARK.—Like the last this species was scarce about Warland, due in this case to the lack of open fields, but was very plentiful about Libby.

Euphagus cyanocephalus. BREWER'S BLACKBIRD.—This species was not seen at Warland but at Libby a small colony was found nesting in an open field. Of several nests found May 29 all were being built but one and this held four fresh eggs. It was in a thick clump of low bushes at the side of a stump, within a foot of the ground, and was compactly built of small twigs, weed stems and rootlets, lined with horse hair. On returning to this place on June 8, a nest previously being built was found to hold six slightly incubated eggs. It was on the ground in a clump of small bushes and against the side of an old weathered stump, and was made of twigs, weed stems, grasses and mud, lined with horse hair.

Carpodacus cassinii. CASSIN'S PURPLE FINCH.—This was a plenti-

ful bird not only toward the tops of the mountains but in the slashings and open woods in the valley. On my arrival in late May they were still in small flocks and evidently did not nest until the latter part of June. By the middle of September small flocks were again much in evidence about thickets and underbrush in the slashings.

***Loxia curvirostra minor*.** CROSSBILL.—On June 6 a small flock of ten birds was seen and from this date on this species gradually increased until it had become exceedingly abundant. During July and August small flocks were especially numerous and could be seen anywhere and at any time during the day, feeding in the tops of the firs or flying noisily by overhead.

***Astragalinus tristis pallidus*.** PALE GOLDFINCH.—I have but one record for the occurrence of this species here. On June 15 two birds were seen feeding in the underbrush bordering the Kootenai River.

***Spinus pinus*.** PINE SISKIN.—An abundant bird in the valley and well up the mountain sides. They had evidently finished nesting before I arrived for I invariably found them in small flocks and never singly or in pairs.

***Zonotrichia leucophrys gambeli*.** GAMBEL'S SPARROW.—This species was a scarce summer resident. I found but one pair breeding in the immediate vicinity of Warland, in the narrow stretch of deciduous underbrush bordering the Kootenai River.

***Spizella passerina arizonae*.** WESTERN CHIPPING SPARROW.—A very abundant summer resident. It showed no partiality for any given situation and nested everywhere, in the slashings, in the open woods in the valley, in thickets and underbrush well up the mountain sides, and in the open cultivated country along the river. Fresh eggs were found from the latter part of May until the last of June so evidently two broods are raised. Four eggs were the usual number laid although sets of three were not uncommon and on one occasion, June 7, I found a nest with five well incubated eggs.

***Junco hyemalis montanus*.** MONTANA JUNCO.—A common bird about open slashings and clearings in the woods. A nest found June 18 held four fresh eggs and was sunken in the ground at the top of a low bank, well concealed in the deep grass, at the side of a logging railroad and in the middle of an open slashing in the valley. It was built of grasses and strands of brown moss, lined well with fine grasses, a little deer hair and a few horse hairs. This was undoubtedly a second set for young birds out of the nest several days were seen being fed by their parents on May 31. Another nest found July 2 held three incubated eggs and was sunken flush with the ground in a clump of weeds and at the side of a large stone, in open woods at the edge of a clearing in the valley. It was large and compactly built of weed stems, grasses and strands of brown moss, lined with deer hair and, largely at the bottom, fine grasses.

Melospiza melodia montana. MOUNTAIN SONG SPARROW.—A fairly plentiful summer resident about thickets and underbrush in the slashings and in the open country about the town. A nest was found July 4 with four slightly incubated eggs, four feet from the ground in a cluster of birch shoots at the base of a dead birch in the underbrush at the edge of the Kootenai River. It was large and compactly built of rootlets, weed stems, strips of bark and grasses, lined with horse hair and fine grasses.

Zamelodia melanocephala. BLACK-HEADED GROSBEAK.—An adult male was seen June 15 in the underbrush bordering the Kootenai River so evidently a pair of these birds bred here but I saw them nowhere else during the entire summer.

Piranga ludoviciana. WESTERN Tanager.—An abundant summer resident. Four nests were found, one June 4 with five slightly incubated eggs, another June 6 with four incubated eggs, a third June 22 with four well incubated eggs, and the last July 1 with four fresh eggs. These varied from twenty-five to thirty-five feet from the ground and were all at the outer end of limbs of large Douglas firs. All were alike in construction, being compactly built of fir twigs and rootlets, lined with rootlets and a few horse hairs. The female was incubating on the first nest found and would not flush and finally had to be lifted from the nest by hand.

Iridoprocne bicolor. TREE SWALLOW.—A scarce summer resident, two pairs being found in the slashing between the camp and the town, and one pair about the town itself. The nest of the latter pair, thirty-five feet from the ground in an old charred stub in an open field, was investigated on June 29 and found to hold fourteen incubated eggs. This exceeds by just five eggs the largest set of this species I had ever known to be taken. It was undoubtedly the product of this one pair of birds for no others were ever seen in the vicinity and the eggs were uniform in size and equally well incubated.

Tachycineta thalassina lepida. NORTHERN VIOLET-GREEN SWALLOW.—The only place I found this species was in the rugged gorge a few miles beyond the camp, three pairs of birds breeding in the cliffs there. The nests were in crevices well toward the tops of the cliffs and inaccessible.

Riparia riparia. BANK SWALLOW.—A small colony of six pairs of these birds was found nesting in a low bank at the side of the Kootenai River and just at the edge of the town. A nest dug out June 15 held six fresh eggs and was built of weed stems and grasses, thickly lined with white chicken feathers. The last record for the year was September 7, two birds being seen, feeding over an open field.

Stelgidopteryx serripennis. ROUGH-WINGED SWALLOW.—Several pairs of birds were found nesting with the Bank Swallows but were seen nowhere else. Two nests that were dug out on June 15 were in fully four feet and were well built of weed stems and rootlets, lined with fine

grasses. One held seven well incubated eggs and the other five but slightly incubated. The last birds for the year were seen August 10.

Bombycilla garrula. BOHEMIAN WAXWING.—While I did not actually find this species breeding here there is no doubt in my mind but that it did nest close by, in one of the more secluded valleys, for on Sept. 24 I saw three birds in a slashing within a short distance of the town. This was too early for them to have been driven in by the approach of winter farther north and I feel that had I been able to cover more territory I would possibly have found the spot where they were nesting.

Bombycilla cedrorum. CEDAR WAXWING.—A common breeding bird in the more open country, especially in the underbrush about the town and along the river. The first nest was found June 25 with four fresh eggs, in a horizontal crotch of an alder leaning well out over the river, ten feet above the water. It was built of weed stems, grasses, plant fibres and considerable brown moss, the upper part being entirely made of the last, lined, largely at the bottom, with fine dry weed stems. Another found June 29 held five incubated eggs and was five feet from the ground in a small Douglas fir in a thicket at the edge of a field. A third nest found July 4 held but two incubated eggs and was on a horizontal limb of an alder leaning well out over the river, eight feet from the water.

Vireosylva olivacea. RED-EYED VIREO.—Two singing males were seen during the summer, one in the alders along the creek in the valley and the other in the underbrush bordering the river. A slight but unsuccessful attempt was made to find the nests.

Vireosylva gilva swainsoni. WESTERN WARBLING VIREO.—A fairly plentiful summer resident, found invariably about the scattered deciduous thickets in the open pine woods on the south slopes of the mountains. A nest found June 17 held three slightly incubated eggs and was eight feet from the ground at the outer end of a limb of a maple sapling at the edge of a thicket. It was built of grasses and strands of brown moss, lined with fine grasses and a few horse hairs, the outside being more or less covered with white downy spiders' egg cases. This nest was taken and on July 1 the bird was again incubating three eggs in a nest nine feet from the ground in a maple sapling in a thicket.

Lanivireo solitarius cassini. CASSIN'S VIREO.—A plentiful summer resident. One nest was found and this on June 6 held four slightly incubated eggs. It was twenty feet from the ground at the outer end of a limb of a small yellow pine at the edge of a clearing in the woods and was built of crushed fragments of weed stems and grasses, lined with fine grasses, the outside being sparingly covered with white downy spiders' egg cases. On September 14 the birds were still seen daily and were frequently heard singing.

Dendroica aestiva aestiva. YELLOW WARBLER.—The deciduous

underbrush along the river was the only place inhabited by this species but the birds were remarkably plentiful there. Three nests were found, within a radius of five hundred yards, one June 8 with five incubated eggs, and two June 11 each with four slightly incubated eggs. Two were in birch saplings and one in a bush and all were within five feet of the ground. The nests differed in no way from those characteristic of this species, being made of gray plant fibres and grasses, lined with plant down, feathers and a few horse hairs.

***Dendroica auduboni auduboni*.** AUDUBON'S WARBLER.—A plentiful summer resident. A nest found June 19 held four small young and was fifteen feet from the ground at the outer end of a limb of a Douglas fir in a ravine. It was made of gray plant fibres, grasses, feathers and a little moss, lined with feathers, deer hair and a little horse hair. This nest had a tragic ending for a forest fire swept through this ravine a few days later and the young birds were burned to a crisp.

***Dendroica townsendi*.** TOWNSEND'S WARBLER.—A fairly plentiful summer resident, being found largely in the scattered ravines. From the time of my arrival until the latter part of June I spent considerable time in attempting to locate a nest but all my efforts were unsuccessful. The males fed and sang in the tops of the largest trees and it was difficult to even get a view of one let alone trail one to a nest. My experience convinced me that the birds nested high and when I think of the size of some of those western yellow pines I am not at all sure that I could have gotten to a nest if I had found one. The song of the Townsend's Warbler is quite distinctive and unlike any other of this family that I have ever heard, and I would render it as "zee, zee, zee-slee-slick," the last two notes being abrupt and high pitched and having a certain resemblance to a note of the Chickadee. Another song less commonly heard was less distinctive, being a "zee, zee, zee, tzee, tzee," the last two notes being lower in pitch than the others.

***Seiurus noveboracensis notabilis*.** GRINNELL'S WATER-THRUSH.—In a dense alder swamp in the valley one pair of these birds was found breeding but several mornings spent in splashing and tumbling about through the thickets and scattered pools produced no results so far as finding the nest was concerned.

***Oporornis tolmiei*.** MACGILLIVRAY'S WARBLER.—A fairly plentiful summer resident in thickets and underbrush in the valley. A nest found June 20 held four fresh eggs and was five feet from the ground in a crotch of an alder some distance away from the nearest underbrush. It was rather bulkily built of weed stems, grasses and strips of bark, lined with horse hair. This was evidently a second brood or more probably another attempt to rear young after the first nest had been destroyed, for several days before I had seen young birds already out of the nest. August 31 the last bird for the year was seen.

***Geothlypis trichas occidentalis*.** WESTERN YELLOW-THROAT.—

Somewhat to my surprise this bird was not found breeding here and I have but one record for its occurrence, one bird, a fall migrant, being seen Sept. 7.

***Wilsonia pusilla pileolata*.** PILEOLATED WARBLER.—This bird bred in the open mountain meadows at a higher altitude than Warland could boast of and none were seen about the town during the summer months. One bird, a spring migrant, was seen May 29 and from Aug. 26 until Sept. 14 birds were seen at infrequent intervals in thickets and underbrush in the valley.

***Setophaga ruticilla*.** REDSTART.—A scarce summer resident along the river, and but rarely seen during the fall migration.

***Dumetella carolinensis*.** CATBIRD.—This bird was found only in the underbrush bordering the river but it was quite plentiful there, at least six pairs nesting within a short distance of the town.

***Salpinctes obsoletus obsoletus*.** ROCK WREN.—On June 1, while crossing a talus slope in the rugged gorge beyond the camp I came across one of these birds feeding among the rocks, and heard it sing several times. But one pair was seemingly breeding there and I saw no others anywhere else in the vicinity.

***Troglodytes aedon parkmani*.** WESTERN HOUSE WREN.—A common summer resident about the town and in the slashings in the valley. A nest found June 8 held seven well incubated eggs and was under the eaves of a shed. Another found June 14 held seven fresh eggs and was on the frame above the door of, and inside, an old logging camp bunk house in a slashing in the valley. It was a mass of twigs and a few weed stems and grasses, the cavity in the top being well lined with feathers and horse hair. A third nest found July 1 was the most interesting for it was built behind a loose piece of bark on a dead larch in a slashing, five feet from the ground. In construction it differed in no way from the others, being built of twigs and grasses, lined with feathers. It held one fresh egg and later was found to be deserted. The last bird for the year was seen September 14.

***Nannus hiemalis pacificus*.** WESTERN WINTER WREN.—A scarce summer resident in the alder thickets along the stream in the valley.

***Certhia familiaris montana*.** ROCKY MOUNTAIN CREEPER.—Although fairly plentiful during the summer months, this bird evidently bred well towards the tops of the mountains for it was not until the latter part of June that any were seen in the valley.

***Sitta carolinensis nelsoni*.** ROCKY MOUNTAIN NUTHATCH.—Plentiful both in the slashings and in the open pine woods. They breed early for the first nest found May 30, twenty feet from the ground in a cavity in the top of a stub, held small young.

***Sitta canadensis*.** RED-BREASTED NUTHATCH.—This species was even more plentiful than the last and likewise nested both in the slashings

and in the open pine woods. I found quite a few nests but I was unfamiliar with the breeding habits of these birds and this lack of knowledge resulted in my data consisting entirely of nests with young. As I learned to my sorrow the birds continue to carry pitch to the entrance of the nest from the time the nest is first begun until the young have flown. For over a week I watched the birds make frequent trips carrying pitch and thought all the time that they were still building but as it turned out the females were then incubating full sets. On June 16 I found a nest containing almost fully grown young that was but two feet from the ground in an old rotten stub and during the fifteen minutes that I watched the birds they made seven trips to the nest, carrying each time not food but pitch which they carefully smeared on any wood that was exposed within several inches of the entrance. Another nest that was found was fully a hundred feet from the ground in the dead top of a larch but the average height was thirty feet.

***Sitta pygmaea pygmaea*.** PYGMY NUTHATCH.—Plentiful in the open slashings in the valley. After they had finished nesting they wandered about in quite large flocks and at this time were noisy and much in evidence.

***Penthestes atricapillus atricapillus*.** EASTERN CHICKADEE.—I have but one record for the occurrence of this species here, two birds being seen on August 26, feeding in underbrush in the valley.

***Penthestes gambeli gambeli*.** MOUNTAIN CHICKADEE.—A plentiful resident, both in the valley and well up the mountain sides. A nest found June 6 held but three incubated eggs and was thirty-five feet from the ground in a knot hole in the trunk of a large larch in the open pine woods part way up the mountain side. It was a matted well cupped bed of deer hair and soft fur. The female was incubating and flushed when the tree was rapped. Another nest found June 10 held seven slightly incubated eggs and was but a foot from the ground in a natural cavity in an old charred stump on an open hillside. The female flushed as I passed and revealed the nest which otherwise would never have been noticed. On June 12 birds were seen feeding young in a nest fully eighty feet from the ground in the trunk of a large dead larch in a burnt-over slashing so it can be seen that this species is not at all particular as to the situation in which the nest is built.

***Regulus satrapa olivacea*.** WESTERN GOLDEN-CROWNED KINGLET.—This species was a scarce summer resident and but few bred about Warland.

***Regulus calendula calendula*.** RUBY-CROWNED KINGLET.—This bird was plentiful during the summer months in the open pine woods in the valley, feeding and singing in the tops of the largest trees. An attempt was made to find at least one nest, but it proved very difficult to even see the birds and trailing one to a nest was practically impossible.

Myadestes townsendi. TOWNSEND'S SOLITAIRE.—A fairly plentiful summer resident in the valley. A nest found May 30 held four well incubated eggs and was in a crevice in the face of a cliff at the side of the creek, twelve feet from the ground and ten feet down from the top. It was bulky but flat, of weed stems, twigs and grasses, lined with fine grasses and dry pine needles.

Hylocichia ustulata swainsoni. OLIVE-BACKED THRUSH.—A very plentiful summer resident. Fresh eggs were found from June 20 to July 6 and seemingly but one brood is raised. A favorite situation for the nest was in the top of a small Douglas fir within eight or nine feet of the ground although one nest was found in a birch, another in an alder and several in bushes within four feet of the ground. In construction the nests varied little being small and compact, built of weed stems, grasses and moss, lined with fine grasses, moss, and fragments of dead leaves. September 16 the last bird for the year was seen.

Planesticus migratorius propinquus. WESTERN ROBIN.—Coming from the east it seemed strange to me to find these birds as plentiful deep in the woods as they were about the towns and in the open cultivated country. They were abundant everywhere but away from civilization they showed a marked preference for clearings or the more open woods. One thing I did notice was that they nested earlier about the towns than in the woods for at Libby on May 29 I found nests with well incubated eggs while about the logging camp the first nests found June 3 held fresh eggs. Evidently two broods are raised for fresh eggs were found as late as July 20.

Ixoreus naevius meruloides. NORTHERN VARIED THRUSH.—A scarce summer resident and found invariably in secluded ravines.

Sialia mexicana occidentalis. WESTERN BLUEBIRD.—This species was fairly plentiful in slashings and clearings in the woods. A nest found June 11 held five fresh eggs and was four feet from the ground in a cavity in an old rotten stub in the middle of a slashing. It was substantially built of grasses. Another nest found June 15 held five fresh eggs and was ten feet from the ground in a hole in the trunk of a large dead yellow pine.

Sialia currucoides. MOUNTAIN BLUEBIRD.—This species was about as plentiful as the last and was found with it in the slashings, and more commonly about the town. Two nests found May 29 both held six fresh eggs, and were within four feet of the ground in cavities in stumps. One was unusually well built of weed stems, grasses, and chicken feathers, lined with feathers and soft shreds of inner red bark.

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THE FEEDING HABITS OF THE BLACK SKIMMER.

BY STANLEY CLISBY ARTHUR.

Plates XX and XXI.

To those who have studied the sea birds no species is of more interest than the Black Skimmer (*Rynchops nigra*) principally because of the unique formation of its bill, in which the maxilla is not only capable of excessive vertical movement but is a great deal shorter than the lower mandible. With such a difference in the length of the two parts of the bill it is quite beyond contradiction that this inch and a half of excessive growth denotes some highly specialized function.

Just what is this function?

Thomas Pennant, who in 1781 gave the bird its present common name, wrote: "I call it Skimmer from the manner of its collecting its food with the lower mandible as it flies along the surface of the water."¹

This British naturalist was probably among the first to give voice in ornithological literature to the commonly accepted version that the Black Skimmer so secures its food. As Mark Catesby had already figured and described the bird (which he called a "Cut-water") it is quite possible that Pennant attributed functions of feeding from hearsay evidence and not from personal observations.

Charles Darwin said of a flock of "Scissor-beaks" he saw flying over a lake in Argentina: "I saw several of these birds, generally in small flocks, flying rapidly backwards and forwards close to the surface of the lake. They kept their bills wide open, and the lower mandible half buried in the water. Thus skimming the surface, they ploughed it in their course . . . and dexterously manage with their projecting lower mandible to plough up small fish, which are secured by the upper and shorter half of their scissor-like bills."²

¹ Gen. of Birds, p. 52.

² Voyage of the Beagle, Ch. VII.

Skimmers, according to Audubon: "spend the whole night on the wing, searching diligently for food. . . . I have seen a few of these birds glide in this manner in search of prey over a long salt-marsh bayou or inlet, following the whole of its sinuosities, now and then lower themselves to the water, pass their bill along the surface and, on seizing a prawn or small fish, instantly rise, munch and swallow it on the wing."¹

Alexander Wilson goes rather into detail in regard to the feeding habits of this bird which he calls a "Shearwater" and his observations are most interesting: "The Shearwater is formed for skimming, while on the wing, the surface of the sea for its food, which consists of small fish, shrimps, young fry, etc., whose usual haunts are near the shore and towards the surface. That the lower mandible, when dipt into and cleaving the water, might not retard the bird's way, it is thinned and sharpened like the blade of a knife; the upper mandible being at such times elevated above the water is curtailed in its length as being less necessary, but tapering gradually to a point, that, on shutting, it may offer less opposition. To prevent inconvenience from the rushing of the water, the mouth is confined to the mere opening of the gullet which, indeed, prevents mastication taking place there; but the stomach, or gizzard, to which this business is solely allotted is of uncommon hardness, strength and muscularity, far surpassing in these respects any other water bird with which I am acquainted.

"Whoever has attentively examined this curious apparatus and observed the possessor, with his ample wings, long bending neck and lower mandible, occasionally dipt into and ploughing the surface and the facility with which he procures his food, cannot but consider it a mere playful amusement, when compared with the dashing immersions of the Tern, the Gull, or the Fish-hawk, who, to the superficial observer, appear so superiorly accommodated. . . . On examining the stomachs of several of these, shot at the time, they contained numbers of small fish usually called *silver-sides*."²

¹ Ornith. Blog. IV, pp. 204-206.

² Am. Ornith., Vol 7, pp. 90-91.

The Rev. J. G. Wood, widely read because of the lavishness of the woodcuts in his works, in his text on the Skimmer quotes Rene P. Lesson, (noted for a number of his ornithological blunders) when describing the bird's feeding habits: "It [the Skimmer] does not, however, trust solely to the wide seas for its food for according to Lesson, who was an eyewitness to the scene, the bird feeds on bivalves, adroitly inserting its beak into their shells as they lie open and then banging the shell against a rock or stone so as to break the hinge and expose the inhabitant which is immediately scooped up and swallowed."¹

The careful Coues in describing the Skimmer's feeding habits is not so positive as some other writers as to the function of the elongated bill, but does help in furthering Lesson's preposterous observation that the bird pries open oysters and other bivalves with its thin and weak bill.

"They seem to feed," he says, "as they skim low over the water, with the foreparts inclined downward, the under mandible probably grazing or cutting the surface; but they are said to use their odd bill to pry open weak bivalve mollusks."²

The popular bird literature of today differs but little in describing the feeding habits of the Skimmer. Says Chapman: "Skimmers are unique both in the form of the bill and in their manner of feeding. Opening the mouth, the blade-like lower mandible is dropped just beneath the surface of the water; then, flying rapidly, they may be said to literally 'plow the main' in search of their food of small aquatic animals."³

Reed, in his popular work, claims: "They fly in compact flocks, in long sweeps over the water, feeding by dropping their long, thin mandibles beneath the surface and gathering in everything edible that comes in their path."⁴

Hornaday has this to say of the Skimmer's feeding habits: "When seeking food the Skimmer looks for calm water, and then, with most dexterous and well-balanced flight, it slowly wings its

¹ Nat. Hist. Birds, p. 753.

² Key to N. A. Birds, p. 1019.

³ Handbook Birds N. E. America, p. 172.

⁴ Bird Guide, Water Birds, p. 56.

way close down to the surface, so low that the lower mandible is actually held *in the water* while the bird is in full flight. Any small object that happens to lie on the surface is shot into the mouth, through what is really a very small opening.”¹

F. H. Knowlton, in his ‘Birds of the World,’ says the Skimmer’s peculiar bill is an obvious adaptation for securing food: “They do not dive for their food as do the Terns, nor do they pick it up while swimming, for they rarely sit upon the water; but they obtain it by skimming rapidly over the surface with the lower mandible dipped into and cleaving the surface, thus scooping it up much after the manner of whales. The thinning of the lower mandible is clearly for the purpose of reducing the friction in passing through the water, while the upper one is shortened and has become movable to keep it out of the way. The Indian Skimmer (*R. albicollis*) according to Mr. Blanford, is usually seen on broad and smooth rivers down to the tideway, not in torrents nor, so far as known, on the sea. They are usually found in the morning and evening flying, often in scattered flocks, rather slowly close to the water, now and then dipping their bills in the stream. They occasionally catch fish, but he doubts if it is their general custom, and asserts that the use of the bill is still unknown, a statement in direct conflict with that of his distinguished countryman.” (Darwin quoted also as above.)²

What I have to here advance, as a contribution to the feeding habits of a bird that I have closely and carefully observed and studied for the past seven years, is in the nature of a respectful contradiction to the statements quoted above. My observations fall into two classes, viz:

1. I have *never* seen a Skimmer secure its fish food *while skimming the waters with its under mandible immersed*, as set forth by Pennant and those who have written of this bird since his time.

2. I *have* seen the Black Skimmer secure its food and collect the fish in an entirely different manner from the generally attributed mode.

¹ Am. Nat. Hist., Vol. III, p. 257.

² Birds of the World, p. 394.

Louisiana offers exceptional opportunities for the study of the gulls, terns, Skimmers and other waterbirds. Up to 1915, from what I had gleaned from text books and general bird literature, I held the belief that the Skimmer procured its food as previously described but when exploring the Louisiana bird breeding islands with Theodore Roosevelt a remark by him set me studying this particular species with more than the cursory interest I had previously bestowed upon it.

As a result of this study, after the observance of thousands of Skimmers, at rest and in flight; in summer, when the necessity of feeding young called for incessant fishing upon the part of the adults, and in the fall when the birds were either fishing in pairs or on solitary excursions, I am forced to doubt that the Skimmer secures its sustenance in the orthodox manner, and am prepared to prove that it procures its food, or at least a part of it, by an entirely different method.

Every trip of inspection that brought me in contact with the Skimmer subsequent to my discussion with Col. Roosevelt as to the reason for the unequal lengths of this bird's bill, I kept close watch on every flying and "skimming" member of this family seen. From the deck of the conservation patrol boats, on which I made most of my trips over the Louisiana waters, aided by the magnified vision binoculars gave me, I have had exceptional opportunities for studying the Skimmer. On not one occasion out of the thousands of birds noted did I once behold one secure, or make any movement of the bills that would suggest that it had so secured food, while in flight. The years 1915, 1916, 1917, 1918 were without results that would tend to prove the bird secured its food in any *other* manner than the method set forth by most writers.

In 1918, while making a survey of the food habits of the Brown Pelican for the United States Food Administration's benefit, I was working from a blind on East Tambalier Island to secure motion and other photographs of a flock of Brown and White Pelicans on a shell reef. While waiting for the White Pelicans to join the Brown, I noted a commotion to the left of my blind—a wild bird chorus made by Black Skimmers and a few Laughing

Gulls. A school of small fish had been chased into a shallow flat, evidently by larger fish, and the birds were soon busy securing food.

A wheeling flock of Skimmers "skimmed" the surface of the lagoon, and then settled into the water, which was scarcely more than three inches deep, and immediately commenced to pick up fish while the birds were in a standing position. As fast as a Skimmer would secure what fish it needed in this manner, it would fly off, without doubt to its nestlings, and others would come splashing into the water, and, standing erect, would secure the fish with straight downward motions of the mandibles. While a number of arriving birds would "skim" the surface of the shallow flat before alighting at no time was there any ocular evidences of fish being picked up and, owing to my close and concealed position, had the birds so secured fish that were most plentiful I would have certainly seen such an act.

The photographs herewith submitted were made at the time and the birds can be seen in the different attitudes assumed while picking fish out of the water. Owing to the position of my blind and the tidal flat it was necessary to make the photographic exposures against the sun which accounts for the slight haziness of the pictures but they are sufficiently distinct to show the variety of attitudes assumed while the birds were actually fishing. This was the first observation made of the feeding habits of the Skimmers. Subsequently I made others, altho I was never near enough to distinctly photograph the Skimmers in the act of so securing their food, but the methods afterwards observed were absolutely identical with those first seen.

The habit of skimming with the mandibles immersed is most noticeable with Skimmers when their nesting grounds are invaded. Alarmed at one's appearance, the birds take to the air and circle about with their characteristic *yap, yap, yap, yap, yapping*. When they pass over the water certain individuals of the flock will skim close to the water, "cutting the surface" with their bills. At this time they are in a highly excited and alarmed state and are not "intent on gathering up everything edible that comes in their path!" Indeed, they are most apprehensive as to what man is

going to do to their eggs and young. Why, then, if this skimming the waters with the mandibles is a highly specialized feeding function, should they at this time adopt their so-called fishing mode of flight?

According to Wm. T. Blanford's observations of the Indian Skimmer this bird only "*occasionally* catches fish" while skimming and he doubts if it is their general custom to so secure food, and asserts that the actual use of the peculiar bill is still unknown. I cannot but feel that this is equally true of *Rynchops nigra*. In the case of the actual capturing of prey that I have observed I note that the Skimmer always fishes in very shallow water and while in a standing position. The act of seizing prey is done by straight downward motions of the head and neck, something akin to the chopping movement of an axe. The fish are seized and held at right angles to the bird's bill before swallowing, and the movements necessary to secure the fish are rather slow and deliberate. When seized and held the Skimmers do not show any marked ability to "deftly swallow their prey," as a matter of fact, the act of swallowing is rather labored and accompanied by a great deal of shaking of the mandibles to place the fish in the proper "head foremost" position to insure unobstructed passage to the crop. "Skimming" birds joining the feeding birds perform the "cut water" trick with *both* mandibles closed tight before alighting and commencing feeding in the manner just set forth.

I therefore count it more than merely strange that with the opportunities that I have had to observe the act, I have yet to see a Skimmer secure its fish food by the skimming method set down in ornithological literature by veteran and abler observers.¹

When carrying fish to their young the parent birds carry the whole fish crosswise in their mandibles. This I have observed on hundreds of occasions. Examinations of the food show that the Skimmers, at least in Louisiana, feed *exclusively* on small fish, and of a great variety of species. I have found they feed upon,

¹ Cf. General Notes beyond. Ed.

the following species arranged in the order of their numerical importance: *Cynoscion nothus*, *Atherina* sp. (Silversides, note Wilson's observation), *Mugil cephalus*, *Scomberomorus maculatus*, *Pomatomus saltatrix*, *Cynoscion nebulosus*, *Sciaenops ocellatus*, *Trachinotus carolinus*, *Carangus hippos*, and others unidentified.

The majority of these fish were secured on the breeding grounds being the food carried to feed the young. The largest fish fed to the young that I was able to secure was 73 mm. in length, but fish this size are only fed to young with feathers. The Black Skimmers have two ways of feeding their young. The downy young are fed by regurgitation, the food being dropped on the ground by the parent bird, but so avid are the little ones for food that they pick at the parent bird's bill as the fish is being dropped, they then pick it up as a tiny chick would take up moistened bread. When the nestlings commence to show feathers they are fed entire fish. The adults fly in from their fishing grounds with the food carried cross-wise in the mandibles and it is given direct to the young bird which invariably secures it head-first. If, by chance, the fish is first dropped to the ground the nestling will secure it by turning its head and bill side-wise. This is not a difficult task and at this time there does not seem to be any physical reason for so doing as at this period the difference in length between the upper and lower mandibles is slight but, to me, indicates a precocity that will prove useful in the adult stage. When Skimmers are first hatched the bills are of equal length and it is not until the young are some weeks old that the curious formation of the lower mandible begins to show by slightly exceeding the upper one in growth.

Attentive observation of the young in various stages was barren of results in a search for a reason for the unusual and unequal growth of the Skimmer's mandibles. The answer lies wholly with the adult bird.

Audubon's assertion that Skimmers "spend the whole night on the wing, searching diligently for food" is not borne out by my observations. While a few of the birds are heard at night I would not say that they are nocturnal but that they are, to a marked

degree, crepuscular. During the reproduction period their fishing habits must be diurnal, especially if young are to be fed.

The insistence of most writers that the skimming is done "with the *under* mandible immersed" does not agree with my observations. The skimming and "plowing the main" is usually done with the mandibles closed save for the times they are opened to permit the cry or "bark." This I can show by photographs of the birds in the act of cleaving the surface of the water. In my collection of photographs I have but one showing the bird cutting the water with its lower mandible only and this bird was "yapping" loudly when so flying over the surface.

My conclusions are that the Black Skimmer does not secure its food in the way generally set forth and that the function of the unique inequality of the mandibles is as yet unknown.

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EXPLANATION OF PLATES.

Plate XX, fig. 1. Black Skimmer cleaving the water with its lower mandible only. This bird was excited and apprehensive over my nearness to its nest of eggs and was not fishing. It was emitting its characteristic "yap, yap, yap" while circling me and when it would pass the tidal flat would lower itself to the surface of the water and cut it with its bill.

Plate XX, fig. 2. Skimmers feeding on a school of fish in a tidal flat. The different attitudes adopted while securing fish can be seen by close inspection. The two birds in the upper left can be observed in the act of catching their prey. One is making straight downward plunges of its mandibles while the other is belly deep in the water having a tussle with the bastard weakfish it has caught (the school consisted of *Cynoscion nothus*). One Skimmer can be observed in the act of alighting in the water to fish in preference to securing food by "skimming" which, in this case, would have been an easy matter if this were its mode of fishing.

Plate XXI, fig. 1. The same flock fishing in the same flat. Note one bird joining the others by skimming over the water with both mandibles closed. After alighting it fished as did the others—standing in the water.

Plate XXI, fig. 2. Skimmers in flight over the water and cleaving it. Note that the two lower birds are cutting the water with the mandibles closed.

DESCRIPTIONS OF SEVEN NEW FORMS OF JAPANESE
AND COREAN PICIDAE.

BY NAGAMICHI KURODA, C. F. A. O. U.

DR. LEONHARD STEJNEGER was the first ornithologist to review the Japanese Woodpeckers (Proc. U. S. Nat. Mus. pp. 99-124, 1886). After his paper we have no other review of these birds except some catalogues or manuals containing descriptions of the species, such as those by Edward Hargitt (Cat. Birds Brit. Mus., Vol. 18, 1890), H. E. Dresser (Man. Palaearct. Bds., Part I, pp. 437-456, 1902), and Dr. Ernst Hartert (Vog. palaearct. Fauna, Vol. 2, pp. 888-941, 1912). Mr. Seinosuke Uchida (Nihon Chorui Zusetsu, Vol. 2, pp. 357-372, 1914, and suppl. pp. 182-185, 1915) also mentions the species of Japanese woodpeckers and makes some remarks upon them. In the present paper are presented descriptions of seven apparently new forms of the family from Japan and Corea.

I beg to tender my sincere thanks to Dr. Leonhard Stejneger and the Associate Curator of Birds in the U. S. National Museum who kindly permitted the examination of the paratype of *Dryobates leucotos subcirris*.

***Dryoscopus martius morii* subsp. nov.**

Diagnosis.—Similar to *D. martius silvifragus* Riley. from Hokkaido and Sakhalin Islands, but distinguished from it by the thicker bill, by the broader base of the upper mandible, by the ridge of the lower mandible being mostly white instead of dark colored and distinct to the base though not sharply defined, and by the culminal ridge being more distinct. The shape of the bill, moreover, especially the lower view of the lower mandible is very different, being less abruptly pointed in the new form. In dry skins the light parts of both mandibles are horn-color tinged with olive, instead of pinkish, as in specimens of *D. m. silvifragus* before me. From *D. m. martius* the new form differs in its larger size, especially the longer wing, while it differs from *D. m. reichenowi* in having the wing distinctly shorter.

The type specimen is from Gunpojo, Keiki District, Central Corea. Adult male, November, 1913. No. 1342 Coll. N. Kuroda. It was presented to me by Mr. Tamezo Mori of the Seoul Higher Common School, in honor of whom I have proposed the subspecific name.

Habitat.—Probably confined to the Korean Peninsula.

Measurements.—Five males from Corea, including the type: wing, 245 (243–346 mm.); tail, 168 (165–174); tarsus, 35 (34–37); outer anterior toe, 25 (24–25); outer posterior toe 23 (22–23.5); inner anterior toe, 18.5 (18–19); inner posterior toe, 11 (10–12); culmen, 65.1 (63–67.5); width of upper mandible at base, 22 (22–22.5). No females have been examined.

Type: wing, 246 mm.; tail, 165; tarsus, 35.5; outer anterior toe, 25; outer posterior toe, 22; inner anterior toe, 18.5; inner posterior toe, 10; culmen, 63; width of upper mandible at base, 22.5.

***Picus awokera takatsukasae* subsp. nov.**

Diagnosis.—Resembles *P. awokera horii* Takatsukasa, of Kiusiu and Shikoku but distinguished by the much darker general coloration and less of the green tinge; by the wing-coverts being deeper in color and less bright; by the dark yellowish olive instead of bright yellow under tail-coverts; and by the under parts being tinged with gray instead of olive green. Head, sides of neck and face also distinctly darker.

The type specimen is from Anno, Tanegashima, one of the largest islands of southern Kiusiu. Adult female, January 4, 1920, collected by Mr. T. Yasaka. No. 5298 Coll. N. Kuroda. The subspecific name is given in honor of Prince N. Takatsukasa, President of the Ornithological Society of Japan.

Habitat.—Probably confined to the island of Tanegashima, southern Kiusiu.

Measurements.—Wing, 135 mm.; tail, 94.5; tarsus, 24; outer anterior toe, 21.5; outer posterior toe, 18.5; inner anterior toe, 15; inner posterior toe, 7.5; culmen, 33.5; width of upper mandible at base, 11.5.

Mr. Ogawa examined two specimens from Tanegashima, taken in November and December, and wrote as follows: "Both quite identical with Hondo specimens" (Annot. Zool. Japon. V., p. 202, 1905). This identification is, however, probably in error as the Hondo form (*P. a. awokera*) is much paler than that from Kiusiu (*P. a. horii*) while the present race is the darkest of all.

***Yungipicus kizuki matsudairai* subsp. nov.**

Diagnosis.—Very similar to *Y. k. kizuki* of Kiusiu, but the wing averages longer, 81–88.5 mm. in the present form instead of 79–83.5 mm. in *kizuki*, while the upper mandible is rather broader at the base, 7.5 mm., instead of 6–7 mm.

The type specimen is from Miyakeshima, one of the seven islands of Izu, Japan. Adult male February 15, 1918, collected by Y. Iwaya. Coll. N. Kuroda, No. 3160. The subspecific name is in honor of Viscount Y. Matsudaira who kindly loaned me his series of specimens from Miyakeshima.

Habitat.—Confined to the Seven Islands (Miyakeshima) of Izu, Japan.

Measurements.—Four males: wing, 81–83 mm.; tail, 47–48.5; tarsus, 14.5–15; outer anterior toe, 10–11; outer posterior toe, 12–13; inner anterior toe, 8.5–9.5; inner posterior toe, 5–6; culmen, 16.5–17; width of upper mandible at base, 7.57.

Five females: wing, 85–88.5 mm.; tail, 47.5–50.5; tarsus, 15; outer anterior toe, 11–11.5; outer posterior toe, 13–13.5; inner anterior toe, 9–9.5; inner posterior toe, 5.5–6; culmen, 16.5–17; width of upper mandible at base, 7.5.

Type: wing, 82.5; tail, 47; tarsus, 15; outer anterior toe, 10; outer posterior toe, 12.5; inner anterior toe, 8.5; inner posterior toe, 5; culmen, 17; width of upper mandible at base, 7.5.

I have examined nine specimens of this subspecies and the characters mentioned above are constant. Dr. Hartert also found that two specimens from the same island had the wing longer than typical *kizuki* and wrote as follows: "Zwei Exemplare von Mijakeschima (Sieben-Inseln) scheinen auch zu dieser Form (*kizuki*) zu gehören, Obwohl die Flügel 83 (♂) und 87 mm. (♀) messen. (Grössere Masse finden sich bei diesen Formen oft, aber nicht durchweg, beiden Weibchen)." (Vogel. Palaearct. Faun., 2. p. 928.)

***Dryobates major hondoensis* subsp. nov.**

Diagnosis.—Resembles *D. major japonicus*, from Hokkaido and rarely north Hondo, but differs in the under parts averaging deeper buffy or brown, never nearly pure white; the ear-coverts are also almost always tinged with light brown, the white scapulars are more or less tinged with buffy as is also the frontal patch while the white spots on the wings are smaller. From *D. m. tschkerskii* it differs in having the under parts distinctly darker and the upper mandible narrower at the base—9.5–11 mm. instead of 12–12.5 mm.

The type specimen is from Minami-azumi-gori, Prov. Shinano, central Hondo. Adult male collected by T. Takayama, January, 1920, No. 4927, colln. N. Kuroda. It is a specimen in the dark phase of plumage.

Habitat.—Hondo, Japan, extending from northernmost Hondo to the central parts (Prov. Suruga). I have not seen specimens from south of Prov. Suruga. This form is no doubt a palaearctic bird and does not range so far south as the next species (*D. leucotis* group). It breeds on Norikura and Takenoshita, Prov. Suruga. One specimen from Corea agrees perfectly in color with the Hondo form but five others from that country are typical *japonicus* in every respect, so that the occurrence of *hondoensis* in Corea is still questionable. The type locality of *japonicus*

was designated by Dr. Stejneger as *Yesso* (= Hokkaido). It rarely visits northern Hondo.

Measurements.—Twenty-two males: (Hondo) wing 124–135.5 mm.; tail, 77–85.5; tarsus 20–22.5; outer anterior toe, 14.5–16; outer posterior toe, 16.5–18; inner anterior toe, 11.5–13; inner posterior toe, 6–8; culmen, 28.5–32; width of upper mandible at base, 9.5–11.

Twenty-three females: (Hondo) wing, 124–134; tail, 76.5–90; tarsus, 20–22.5; outer anterior toe, 14.5–16; outer posterior toe, 16–18.5; inner anterior toe, 11.5–13; inner posterior toe, 7–8; culmen, 27.5–30.5; width of upper mandible at base, 9.5–11.

Female from Corea: wing, 128.5; tail, 83; tarsus, 21; outer anterior toe, 15; outer posterior toe, 17; inner anterior toe, 12; inner posterior toe, 7; culmen, 31; width of upper mandible at base 11.

Type: wing, 129 mm.; tail, 85.5; tarsus, 20; outer anterior toe, 15; outer posterior toe, 17; inner anterior toe, 11.5; inner posterior toe, 7; culmen, 31, width of upper mandible at base, 10.

Dr. Stejneger considered this dark phase to be identical with "*Dryobates gouldii* (Malh?) Gray" (Proc. U. S. Nat. Museum, 1886, p. 112). This statement is however in error. The Hondo bird has white scapulars as in true *japonicus* and *tscherskii* and not wholly black as in *cabanisi* (= *gouldii*). He however mentions the question of the occurrence and validity of the so-called *D. gouldii* from Japan (Proc. U. S. Nat. Mus., 1892, pp. 299–300). He also states that the Tokyo specimen has all the white portions strongly washed with deep ferruginous, evidently a superficial stain (op. cit., 1893, p. 630). I have examined forty-five specimens from many parts of Hondo with the following result:

(a) In the Hondo specimens (*hondoensis*) all adults, the under parts vary from pale to very dark and the birds are divisible into three phases: a pale one represented by seven examples; a medium one with fourteen examples and a dark one to which eighteen are referable. The typical *japonicus* from Hakkaido is distinctly paler than even the pale phase of *hondoensis*.

(b) The bars on the outermost tail feathers vary from very distinct and broad to very narrow while extreme examples have them broken up into spots. A specimen from Wakayagi, Prefect Miyagi, Hondo, has only one spot on the outer web of the outermost tail feathers. I am therefore inclined to think that the shape and number of bars on the outer tail feathers of this form

have no value in systematic study, being subject to individual variation.

***Dryobates leucotis stejnegeri* subsp. nov.**

Diagnosis.—Very similar to the deeper colored phase of *D. leucotis subcirris* from Hakkaido, but distinguished by the white of the back and under surface being always more strongly washed with buff. The white spots on the wing are constantly smaller while the wing is shorter and the red on the abdomen much deeper. It differs essentially from the paler colored phase of *subcirris* from Hakkaido.

The type specimen is from Minami-azumi-gori, Prov. Shinano, central Hondo. Adult male, collected by T. Takayama, November, 1918. No. 4931, colln. N. Kuroda. Named in honor of Dr. L. Stejneger.

Habitat.—Apparently confined to northern and central Hondo (Nagano, Nikko, etc.). It breeds in trees at Nikko and Hida. South of Yokohama, on the Pacific side of Hondo there are two other forms.

Measurements.—Six males: wing, 149–152.5 mm.; tail, 84–95; tarsus, 25–26.5; outer anterior toe, 16.5–19.5; outer posterior toe, 20–22.5; inner anterior toe, 13.5–16.5; inner posterior toe, 7.5–9; culmen, 42–42.5; width of upper mandible at base, 13.5–14.5.

Four females: wing, 141–151; tail, 84–92; tarsus, 25–27; outer anterior toe, 17.5–20; outer posterior toe, 20.5–22; inner anterior toe, 14–15.5; inner posterior toe, 8.5–10; culmen, 40; width of upper mandible at base, 12.5–14.5.

Type specimen: wing, 152.5; tail, 95; tarsus, 25; outer anterior toe, 18.5; outer posterior toe, 21.5; inner anterior toe, 15; inner posterior toe, 9; culmen, 42; width of upper mandible at base, 14.

I have compared ten specimens from the central and northern parts of Hondo with fifteen of the true *subcirris* from Hakkaido with the following results.

(a) Only one form (*subcirris*) occurs in Hokkaido but there are two color phases. One of these has the paler under parts almost as white as in *uralensis* but its proportions are larger. The other has the under parts somewhat tinged with buffy as stated by Dr. Stejneger. (Proc. U. S. Nat. Museum, 1886, pp. 113–115.)

(b) Thanks to Dr. Stejneger I have had the opportunity of examining the paratype of *D. l. subcirris* from Sapporo, obtained by Blakiston, October 12, 1882, No. 96001, colln. U. S. N. M., adult female). Dr. Stejneger's description of the type (op. cit. 1886, p. 113) agrees well with this paratype but differs somewhat from other Hakkaido specimens before me though among the latter I find some similar in color to the one that Stejneger de.

scribed. These birds are however practically differentiated from Hondo examples by the decidedly larger white area on the lower back and by the decidedly larger white spots on the wing, larger even than in some of the buff tinted specimens. Stejneger's type specimen must be separated from the Hondo birds and it apparently belongs to the deeper colored phase of the Hokkaido form. The Hondo bird never occurs in Hokkaido.

(c) The white area on the lower back and rump in true *subcirris* is subject to variation, being larger in full plumaged winter specimens and smaller in those taken in summer, just after the molt, or in autumn when the feathers have not attained their full growth. The black lower back (tergum) is covered with white feathers but the amount of white here and on the rump is variable being apparently more developed in Hokkaido examples as mentioned by Dr. Stejneger.

(d) There are no doubt two phases of *stejnegeri*, the Hondo form. One of these is darker colored and the other paler and much nearer to the Hokkaido race, though the white on the back is much restricted and does not extend to the upper back while the white spots are usually smaller and the ear-coverts always tinged with light brown.

(e) The greater wing-coverts in *stejnegeri* have the white spots on the outer webs shorter than in *subcirris* being 7-9.5 mm. (rarely 11) in the former and 9-12.5 mm. (rarely 14 or 15 mm.) in *subcirris*.

(f) The pale spots on the third pair of tail-feathers are very much smaller in *stejnegeri* than in *subcirris* as Mr. Uchida has pointed out (Nihon Chorui Zusetsu, Vol. 2, p. 363) and the variation in the size of these spots is not so great.

***Dryobates leucotis intermedius* subsp. nov.**

"1913. An intermediate form between *Picus leuconotus subcirris* (Stejneger) and *Picus namiyei* (Stejneger)," Kuroda, (Dobutsugaku Zasshi, 1913, p. 333) from Dorogawa, Prov. Yamato, Hondo.

Diagnosis.—Near to *D. leucotis namiyei*, but with the pale area on the back larger, the white spots on the greater wing-coverts larger and three in number instead of two (or entirely lacking); the streaks on the chest and breast fewer in number and the ear patch and lateral neck patch us-

usually continuous above or only partly separated by a black line. Differs from *D. l. stejnegeri* in having the pale area on the back smaller, the white wing spots especially on the coverts smaller and the red of the under parts deeper and extending farther forward.

The type specimen is from Dorogawa, Prov. Yamato, Hondo. Adult female obtained by Mr. N. Teraoka, January 4, 1913. No. 948 colln N. Kuroda.

Habitat.—This intermediate form inhabits the Pacific side of Hondo from Prov. Sagami and Suruga to Prov. Yamashiro, Kii and Yamato as well as Prov. Iyo Shikoku where *D. l. namiyei* also occurs. The specimens from Yamashiro are on the average whiter than those from Yamato and Kii, while an example from Sagami is paler than two from Suruga. This race is no doubt a climatic form and not a hybrid between *stejnegeri* and *namiyei* as considered by Viscount Matsudaira.

Measurements.—Five males (Yamashiro): wing, 147–155; tail, 90–96.5; tarsus, 24–26; outer anterior toe, 17.5–20; outer posterior toe, 20.5–21.5; inner anterior toe, 14–16; inner posterior toe, 8.5–9.5; culmen, 39–42; width of upper mandible at base, 13–14.

Four females (Yamashiro): wing, 140–148.5; tail, 89–91.5; tarsus, 23–23.5; outer anterior toe, 18–20; outer posterior toe, 20–22.5; inner anterior toe, 14–16; inner posterior toe, 7.5–9; culmen, 38.5–42; width of upper mandible at base, 13.5–14.

Type (Yamato): wing, 151; tail, 93; tarsus, 23; outer anterior toe, 17.5; outer posterior toe, 21.5; inner anterior toe, 13.5; inner posterior toe, 8; culmen, 40; width of upper mandible at base, 14.

An examination of seventeen specimens, ten of which were kindly loaned to me by Viscount Matsudaira, yields the following results:

(a) The under parts vary from bright carmine to rose color tinged with carmine or even to grayish rosy.

(b) The subapical white spots on the greater wing-coverts vary from almost as large as in *stejnegeri* to very small as in *namiyei*. The spots on the greater wing-coverts are usually three but on some feathers four, one spot being in that case nearly obsolete.

(c) The white area on the lower back varies considerably in size, the buff tinge being always more or less noticeable. In the type the white back is distinctly tinged with buff while the lower parts are washed with rosy.

(d) The ear-coverts are always tinged with light brown though the color varies somewhat in depth.

***Jynx torquilla hokkaidi* subsp. nov.**

Diagnosis.—Very similar to *J. t. japonica* from Hondo and southward, but differs in the bill being rather longer and higher at the nostril and not so flattened; the distance between the lower edge of the nostril and the cutting edge of the upper mandible is broader, measuring 3 mm. instead of 1.5–2 mm. in *japonica*. In size it is indistinguishable from the latter form. The type specimen is from Yubetsu, Prov. Kitami, Hokkaido. Adult male, collected by Mr. N. Teraoka. No. 568 colln. N. Kuroda.

Habitat.—Island of Hokkaido where it certainly breeds. Stejneger also mentions that the Wryneck breeds in Yesso. A specimen from Sakhalin examined by me belongs to the Hondo form (*japonica*).

Measurements.—Male (type): wing, 79 mm.; tail, 64; tarsus, 18.5; outer anterior toe, 16.5; culmen, 18.5; depth of bill at nostril, 7.

Female: wing, 79 mm.; tail, 62; tarsus, 19.5; outer anterior toe, 17.5; culmen, 20; depth of bill at nostril, 7.

I have examined a pair of adults and a young fledgling from Kitami, Hokkaido. It would seem that a kind of dichromatism is found in this bird as pointed out by Dr. Stejneger (Proc. U. S. Nat. Museum, 1892, p. 296). My specimens belong to the paler phase.

Fukuyoshi Cho, Akasaka, Tokyo, Japan.

NOTES FROM CONNECTICUT.

BY LOUIS B. BISHOP, M. D.

SINCE 'The Birds of Connecticut' was published in 1913 additional specimens have been taken of several of the rarer species; others have been found on earlier or later dates; and a number of species or subspecies taken that were then unknown in the State; all of which it seems advisable to put on record. The specimens collected are in my collection, when not otherwise stated, and were found by myself, when no collector is mentioned. The Glaucous Gull, European Widgeon, Labrador Horned Owl, Say's Phoebe, and Prairie Marsh Wren are new records for Connecticut; and the Boreal Flicker, Nova Scotia Song Sparrow and Newfoundland

Yellow Warbler have not before been reported, though doubtless all occur regularly. The Song Sparrow and Yellow Warbler seem to me good races, as I had long noticed the difference between the specimens here recorded and other Connecticut examples, but I doubt the advisability of recognising the Flicker, as the individual variation seems to be almost, if not quite, as great as the geographic.

Larus hyperboreus. GLAUCOUS GULL.—Two were seen by Mr. Herbert K. Job feeding on the mud-flats off the mouth of West River in New Haven Harbor on March 18, 1916. Mr. Job was able to compare their size with Black-backed and Herring Gulls feeding with them, and thus make a positive identification. This is the first record of this species in Connecticut.

Larus atricilla. LAUGHING GULL.—The protection given these birds and the terns on their breeding grounds in Massachusetts has resulted in many more being found in Connecticut. Dr. L. C. Sanford saw a number of Laughing Gulls in New Haven Harbor in May and June, 1915, and I saw an adult there on June 10; and in August, 1917, Mr. Richard Harrison found them common there.

Oceanites oceanicus. WILSON'S PETREL.—Mr. George E. Verrill found petrels, probably this species, common in Long Island Sound in the summer of 1915, and Professor A. E. Verrill saw them occasionally near Outer Island, Stony Creek, the same year.

Lophodytes cucullatus. HOODED MERGANSER.—Two females were taken on the Quinnipiac Marshes, North Haven, on November 12, 1915, by Mr. William L. Ganung.

Anas platyrhynchos x rubripes.—A young male hybrid between the Mallard and Black Duck Mr. W. L. Ganung shot at West Haven on January 7, 1916.

Mareca penelope. EUROPEAN WIDGEON.—An adult male, with an old and young male and a female Baldpate, came to the decoys of Mr. Edgar Tullock and a friend at Grove Beach on January 2, 1920, and all were secured. Mrs. Gilbert Tullock, who was present when these birds were shot, readily identifying the Widgeon, and knowing its rarity, very kindly gave it to me in the flesh. This is the first Connecticut record.

Mareca americana. BALDPATE.—On the Quinnipiac Marshes a young female was shot by Mr. W. L. Ganung on November 7, 1913, and another on October 11, 1915, by his brother, Mr. Alanson Ganung.

Nettion carolinense. GREEN-WINGED TEAL.—A pair were shot at Clinton on December 14, 1912, and obtained from Mr. John E. Bassett, and another pair on the Quinnipiac Marshes on October 25, 1917, by Mr. Alanson Ganung.

Spatula clypeata. SHOVELLER.—Mr. Alanson Ganung shot a young male on the Quinnipiac Marshes on October 11, 1916.

Dafla acuta. PINTAIL.—A pair of young were taken on the Quinnipiac Marshes on October 2, 1913, by Mr. W. L. Ganung, and a young male there by Mr. A. Ganung on October 7, 1919.

Aix sponsa. WOOD DUCK.—An adult male was shot at Black Hall on December 22, 1914, the sportsman not recognizing its identity until it had been killed.

Marila valisineria. CANVAS-BACK.—A male and a female were taken at West Haven on December 7, 1912, by Mr. W. L. Ganung, and a male on December 31, 1914, by Mr. John E. Haines; and a female on the Quinnipiac Marshes on October 25, 1917, by Mr. A. Ganung.

Marila collaris. RING-NECKED DUCK.—Mr. Alanson Ganung shot two young females on the Quinnipiac Marshes on October 29, 1919.

Histrionicus histrionicus. HARLEQUIN DUCK.—A young male was shot at Branford on December 23, 1913, by Dr. L. C. Sanford and Lord William Percy. It is now in the collection of Lord Percy.

Branta bernicla glaucogastra. WHITE-BELLIED BRANT.—A young male was shot from a flock on the Sound at West Haven on December 18, 1915, by Mr. W. L. Ganung. Professor A. E. Verrill informed me that on May 17, 1914, he saw, with Mr. G. E. Verrill, many flocks of Brant flying north up the Housatonic Valley near the mouth of the Housatonic River; that most were high in the air, but some almost within gunshot; also that he saw others flying northwest while at Outer Island, Stony Creek, about May 22.

Olor columbianus. WHISTLING SWAN.—A young bird, said to have been a member of a flock of four, was shot on the marshes at the mouth of the East Haven River in the early part of November, 1919, by some boys, who had no idea what they had shot, and promptly dismembered it. The pieces were rescued by Mr. E. H. Armstrong of Branford, who reconstructed and mounted it. It is now in the mounted collection which Mr. Valdemar T. Hammer maintains in one of the Branford schools.

Nycticorax nycticorax naevius. BLACK-CROWNED NIGHT HERON.—Two adults and two young, which spent the nights in an evergreen near the home of Mr. H. K. Job in West Haven, were seen by him there as late in the winter as January 22, 1915. Mr. E. H. Armstrong tells me that one spent most of the winter of 1919-20 near Branford.

Rallus elegans. KING RAIL.—A young male was taken on the Quinnipiac Marshes by Mr. Alanson Ganung on October 29, 1914.

Gallinula galeata. FLORIDA GALLINULE.—On the Quinnipiac Marshes I shot a young male on September 23, 1913, and Mr. A. Ganung, a young female on October 10, 1913.

Fulica americana. AMERICAN COOT.—Mr. Eric T. Bradley shot a young male in East Haven on December 26, 1913.

***Limnodromus griseus scolapaceus*. LONG-BILLED DOWITCHER.**—Mr. Harry T. Flint collected a young male at Grove Beach on August 15, 1894, and Mr. Alanson Ganung shot a young female on the Quinnipiac Marshes on September 25, 1913.

***Arquatella maritima maritima*. PURPLE SANDPIPER.**—A young female was shot on the breakwater in New Haven Harbor on November 17, 1915, by Mr. Edward J. Haines, and Mr. E. H. Armstrong collected two in Branford early in November, 1919.

***Cathartes aura septentrionalis*. TURKEY VULTURE.**—On the morning of May 7, 1913, as I was walking along a wood-road on the northern shore of a small lake in West Haven I noticed a strong and most unpleasant odor, which seemed to come from some bushes not far away. Before I could investigate farther I saw a large bird flying rapidly toward me from across the lake, and directly against a light northerly wind, that was blowing. It came nearer and finally circled so closely above my head that there could be no question it was a Turkey Vulture. When it saw me it turned and flew south as rapidly as it came, soon disappearing in the distance. Then I discovered the cause of the odor was the body of a large dog, greatly swollen by putrefaction, that was lying about twenty feet from me, and so well screened by bushes and trees, that it was invisible from above. This is the only Turkey Vulture I have seen in Connecticut, and its actions I can only explain by the belief it had smelt that dog from far away, followed up the scent, and when it reached the spot, not seeing what it expected, had returned as rapidly, whence it came. That this bird was hunting by the sense of smell seems to me beyond question. From its actions there could be little doubt that it thought I was responsible for the delicious perfume it was following, and preferred localities where the possessors of such perfume were less active.

***Aquila chrysaetos*. GOLDEN EAGLE.**—A young female was shot in the outskirts of New Haven on October 19, 1915, by Mr. Nathan A. Small. Mr. Harry T. Flint told me that he saw one very closely in Woodbridge on October 21, 1916. This bird caught a mammal in a thicket, and let him approach within 75 feet as it sat on a post devouring its prey, so that he was able to see plainly the feathered tarsi and golden-brown neck.

***Haliaeetus leucocephalus leucocephalus*. BALD EAGLE.**—A young male Bald Eagle was shot at Lyme on November 28, 1912, and sent me in the flesh by Mr. W. E. Tinker. The length was 31.75 inches, and the extent 78.37.

***Haliaeetus leucocephalus alascanus*. NORTHERN BALD EAGLE.**—A young male was found lying dead in the woods at Indian Neck, Branford, by Messrs. J. E. and E. E. Hall, on March 14, 1915, who very kindly gave it to me. This bird showed no sign of injury, but was greatly emaciated, its pectoral muscles being so wasted that it seemed impossible for

it to have flown in the last days of its life. The length was 34.25 inches, and extent 85.

Falco peregrinus anatum. DUCK HAWK.—The eyrie on Mount Carmel mentioned in 'The Birds of Connecticut' was occupied in the spring of 1912, when Mr. Herbert K. Job found the nest, which contained three eggs on May 27, and again in 1914, when Mr. Harry W. Flint collected two sets of four eggs in April and early May.

Otus asio asio. SCREECH OWL.—Mr. Frank Sherman brought me a Screech Owl on May 30, 1916, which he had found lying dead in Evergreen Cemetery, New Haven. The bird was in perfect plumage, without sign of injury, but the abdomen was greatly distended and green, and the bird emitted a strong gangrenous odor. Protruding from the anus I found what looked like the dry membrane of an egg, and in the abdomen three great masses of dried yolk, one fully the size of a normal egg, and covered with a bloody membrane. Apparently for some reason the shells had not formed on the eggs, the bird had been unable to lay them, and they had remained in the abdomen, and killed the bird.

Bubo virginianus heterocnemis. LABRADOR HORNE OWL.—Mr. R. Beecher Huntley shot a Horned Owl of this race at Black Hall in November, 1917, and sent it to me. It was prepared for me by Mr. B. M. Hartley of New Haven, as I was in California. It is the first record for the State.

Coccyzus erythrophthalmus. BLACK-BILLED CUCKOO.—A female, which I shot in West Haven on May 14, 1915, contained an egg ready for the nest, and Mr. A. A. Saunders found a nest with young on May 28 of that year.

Meianerpes erythrocephalus. RED-HEADED WOODPECKER.—A pair bred in West Haven in 1914, and another on Prospect Street, New Haven, in 1916. Mr. and Mrs. E. C. Stiles with other members of the New Haven Bird Club saw one in Edgewood Park, New Haven, on April 10, 1920, and four, apparently two pairs, in West Haven on April 18.

Colaptes auratus borealis. BOREAL FLICKER.—If this race is accepted, to it must be referred some members of the great flight of Flickers that passes through southern Connecticut in late September and early October. Of Flickers from New Haven in my collection I identify as this three males collected on September 20 and October 1, 1904, and September 30, 1903, and two females taken on October 7, 1901, and September 29, 1903.

Sayornis sayus. SAY'S PHOEBE.—An adult female was shot at Gaylordsville on December 15, 1916, and sent me in the flesh by Mr. E. H. Austin. This bird, or a similar one, Mr. Austin saw about a quarter of a mile from his house a few days earlier, and, noticing it was not the common Phoebe, asked his son to shoot it for me, when he found it again on the fifteenth. It was fat and generally in good condition. This is another new bird for the State.

Empidonax flaviventris. YELLOW-BELLIED FLYCATCHER.—A young female was taken at New Haven on September 13, 1919.

Agelaius phoeniceus phoeniceus. RED-WINGED BLACKBIRD.—An adult male shot at Fairfield on January 17, 1894, was obtained by Mr. J. B. Canfield in the flesh, and is now in my collection, thanks to Dr. Joseph Grinnell.

Euphagus carolinus. RUSTY BLACKBIRD.—A young female collected at Stratford by Mr. W. H. Lucas on December 12, 1891, I have Dr. Grinnell to thank for also.

Hesperiphona vespertina vespertina. EVENING GROSBEAK.—A pair were secured at Pine Rock, Hamden, on March 20, 1916, by Dr. Paul Stetson. This species appeared in Branford the latter part of January, 1920, both sexes having been seen by Mr. V. T. Hammer, and females collected by Mr. E. H. Armstrong, who gave me one taken on February 3. Mr. Richard Harrison reports that a small flock spent much of the past winter on Prospect Street, and Mr. Edgar C. Stiles that three males and nine females were seen by himself, Mr. Harrison and other members of the New Haven Bird Club, on East Rock Park, New Haven, on May 2, 1920.

Loxia curvirostra perna. NEWFOUNDLAND CROSSBILL.—All the Red Crossbills that I have collected in Connecticut (recorded in 'The Birds of Connecticut'), are of the large, long-billed form, which Mr. Bent has separated under this name, except two adult males, which I obtained in North Haven on March 12, 1914. These are of the small race, that apparently is the commoner of the two in Massachusetts. Breeding crossbills, which I collected at Seabright, Halifax County, Nova Scotia, in the summers of 1914 and 1916 were also all the larger race.

Poocetes gramineus gramineus. VESPER SPARROW.—An adult male was taken in East Haven on December 30, 1913, and three others seen.

Passerherbulus nelsoni subvirgatus. ACADIAN SHARP-TAILED SPARROW.—Two males were collected in West Haven on May 29, 1914.

Spizella passerina passerina. CHIPPING SPARROW.—A young female was taken in New Haven on November 5, 1914.

Melospiza melodia acadica. NOVA SCOTIA SONG SPARROW.—Song Sparrows closely resembling Nova Scotia birds in fresh winter plumage were collected near New Haven on January 26, 1878, by Dr. W. H. Hotchkiss; December 13 and 27, 1900; October 31, 1901; September 29 and October 25, 1903; and October 15, 1905. The Song Sparrow breeding on the Magdalen Islands is even redder than the Nova Scotia bird.

Lanius ludovicianus migrans. MIGRANT SHRIKE.—An adult female was collected in North Branford on March 27, 1916. It had been feeding on beetles. I believe this is the first spring bird recorded.

Lanius solitarius solitarius. BLUE-HEADED VIREO.—A female

collected in New Haven on April 24, 1916, and one seen very closely there on November 7, 1915.

Mniotilta varia. BLACK AND WHITE WARBLER.—An adult male was collected at New Haven on October 13, 1913.

Helminthos vermivorus. WORM-EATING WARBLER.—A young female was collected in West Haven on September 16, 1913.

Vermivora lawrenci. LAWRENCE'S WARBLER.—Adult males were collected near New Haven on May 20, 1913, May 18, 1915, and May 9, 1916. The first is in a plumage intermediate with *V. chrysoptera*, and had the song of this species.

Vermivora leucobronchialis. BREWSTER'S WARBLER.—Adult males were collected near New Haven on May 19, 1914, and May 14, 1915. Both had the song of *V. pinus*.

Vermivora peregrina. TENNESSEE WARBLER.—Additional fall records for the vicinity of New Haven are September 27 and October 4, 1913; October 4, 1915; and October 2, 1916. In spring I had never found this warbler until 1916, when it was tolerably common from May 18 to 27. That this bird is really extending its range is shown also by my experience with it at Seabright, Nova Scotia, where I spent the summers of 1914, '15, and '16. The first summer I did not find it at all, collected one male the second, and on the third found it common in the same locality where I had collected almost daily the two previous years, though no change whatever had occurred in the vegetation.

Dendroica tigrina. CAPE MAY WARBLER.—This is another species the records of which in Connecticut have multiplied in recent years. A male was collected near Derby by Mr. J. T. Cullen on May 20, 1912, and one by myself in West Haven on May 19, 1916. New fall records for New Haven are September 15 and 24, 1913, and October 2, 1916.

Dendroica aestiva amnicola. NEWFOUNDLAND YELLOW WARBLER.—If this subspecies is recognized as valid to it must be referred two young males, which I collected at West Haven on September 14, 1904, and New Haven on September 15, 1913, and a young female collected by Mr. A. H. Verrill on Outer Island, Stony Creek, on September 10, 1907. This is the form of Yellow Warbler, which breeds on the Magdalen Islands.

Dendroica magnolia. MAGNOLIA WARBLER.—An adult male was collected at New Haven on October 21, 1905.

Dendroica pennsylvanica. CHESTNUT-SIDED WARBLER.—An adult female was taken at New Haven on September 28, 1912, and a young male on September 29, 1915.

Dendroica castanea. BAY-BREASTED WARBLER.—Additional fall records of young birds from New Haven are two on September 15, 1913, and one on October 2, 1916.

Dendroica fusca. BLACKBURNIAN WARBLER.—Young of this bird

were taken at New Haven on September 24, 1913, and September 22, 1917.

Dendroica vigorsii. PINE WARBLER.—A male was collected at Guilford on April 1, 1916.

Dendroica palmarum palmarum. PALM WARBLER.—Increasing numbers of fall records of this race near New Haven make more probable that Connecticut is in its regular migration route. One was collected on September 28, 1895, by Mr. H. W. Flint, and others on October 12, 1914, and September 13 and 26, and October 8, 1919, by myself.

Seiurus noveboracensis notabilis. GRINNELL'S WATER THRUSH.—That Connecticut is on the regular migration route of this bird also I now believe. A male that I collected in West Haven on May 15, 1914, and a young male in New Haven on September 15, 1913, closely resemble *notabilis* from Alaska and North Dakota, and must be placed with this race.

Oporornis philadelphia. MOURNING WARBLER.—An adult male was collected in West Haven on May 22, 1916.

Wilsonia canadensis. CANADA WARBLER.—A young female collected at New Haven on September 11, 1917, is the latest fall record, and a male seen on August 11, 1919, the earliest.

Mimus polyglottos polyglottos. MOCKINGBIRD.—Mr. Harry W. Flint told me that he saw a dead male on April 8, 1914, that was accidentally killed on that day by a man in whose garden in New Haven it had lived since Feb. 28.

Nannus hiemalis hiemalis. WINTER WREN.—One collected at New Haven on September 15, 1913, is the earliest fall record, and one, which was collected at Beacon Falls on November 27, 1884, and given me by Dr. J. Grinnell, is a late one.

Telmatoodytes palustris iliacus. PRAIRIE MARSH WREN.—A female Marsh Wren, taken by Mr. H. W. Flint near New Haven on October 9, 1895, and now in my collection, Dr. Oberholser agrees with me in calling *iliacus*, of which race it seems typical.

Penthestes hudsonicus littoralis. ACADIAN CHICKADEE.—One was collected in North Haven on December 2, 1913.

Hyllocichla aliciae bicknelli. BICKNELL'S THRUSH.—A male, collected in West Haven on May 27, 1916, is the latest spring date.

Planesticus migratorius migratorius. ROBIN.—A nest containing young only a few days old noted at New Haven on September 1, 1919, is almost a month later than the latest in 'The Birds of Connecticut.'

356 Orange St., New Haven, Conn.

SOME SOUTHERN MICHIGAN BIRD RECORDS.

BY NORMAN A. WOOD.

THE records in the Museum of Zoology, University of Michigan, apparently indicate that several species of birds are in Michigan extending their ranges to the northward, or are becoming more common. The observations on these species are included in the following notes made in Washtenaw County, with some unpublished records of rare forms.

***Marila collaris*. RING-NECKED DUCK.**—Covert, 1881, records this species as "a common migrant". Since that date very few records have been made in this vicinity, and Barrows, 1912, lists it as "a scarce migrant". March 20, 1909, two were seen on the Huron River and a fine adult male, is in the Museum. On April 8, 1912, two were taken from a flock of ten, one of which is now in our collection. Other records are as follows: March 15, 1913; March 15, 1914; April 3, 6, 1914, one or two on Huron River near Ann Arbor; November 16, 1919, one was shot on a small lake near Ann Arbor. The last is our only fall record of this rare duck.

***Grus mexicana*. SANDHILL CRANE.**—On May 30, 1880, the writer saw fifteen Sandhill Cranes in a wheat field in Sharon Township, in the western part of Washtenaw County. The following data were secured in Lyndon Township: May, 1896, a nest containing two eggs; May 25, 1897, a fine adult male; October 25, 1900, an adult female. In October, 1910, an adult bird was taken in the same region by Charles Clark who saw twenty in a flock on March 24, 1911. On September 15 and 26, 1915, two adult males were shot at Mud Lake, Lyndon Township, Washtenaw County both of which are now in the Museum collection. Mr. Koelz reported that he saw twenty-eight there at one time and that a few still breed in a big wet marsh near there, in Jackson County. While the writer was collecting for the Museum on Whitefish Point in the Upper Peninsula, in 1912 and 1914, several birds were seen and hunters said they bred there in the big swamps.

***Astur atricapillus atricapillus*. GOSHAWK.**—Covert, in 1881, lists this species as "a rare winter visitor" which coincides with the experience of the writer who has only the following records for Ann Arbor: an adult male, January, 1897; an immature male, November 20, 1898; December 18, 1917, adult male. When this species wanders south it seems to follow the shores of the Great Lakes, and only rarely occurs inland as far as Ann Arbor.

***Archibuteo lagopus sancti-johannis*. ROUGH-LEGGED HAWK.**—

This species only occurs in Washtenaw County as a rare migrant. The first ones were seen by the writer on January 2, 1888. The next ones were noted March 15, 1897, and March 20, 1899 (a fine male taken in a trap). Since 1899 it has been recorded October 5, 1908; October 30, 1909; March 23, 1912; January 1, October 15, 1917; October 18, 1917 (a bird in black plumage). The writer saw many of this plumage phase among the hundreds that were migrating in May, 1914, at Whitefish Point, Chippewa County, Michigan.

Aluco pratineola. BARN OWL.—Although this southern species has always been listed as rare in Michigan, many recent records show that it is more common than was formerly supposed. The range covers the Southern Peninsula and there is a record of its occurrence near Sault Ste. Marie. There are twenty records for Ann Arbor and vicinity, made at all seasons of the year. Some of the Washtenaw County records are October, 1890 (the first Michigan bird seen by the writer); October 15, 1898, three taken in a swamp; August 25, 1895; May 13, 1900; December 12, 1904; August, 1906; October 15, 1909; April 28, 1912; May 11, 1912, adult female; June 16, 1919, adult male; September 20, 1919, adult female; October 22, 1919.

Cryptoglaux acadica acadica. ACADIAN OWL.—This species is a rare migrant and occasional resident in Washtenaw County. On May 23, 1879, a nest was reported near Ann Arbor, and on January 10, 1881, three were taken in a small tamarack swamp. Other records are December 10, 1896; May 5, 1897 (an adult female that no doubt had bred that season); February 1, 1905; November 30, 1910; April 24, 1915; November 20, 1915 (two seen and one taken). Since that latter date none were reported until April 9, 1919, when one was taken at Ann Arbor.

Hesperiphona vespertina vespertina. EVENING GROSBEAK.—There are no records of this species for Ann Arbor previous to January 10, 1887. Since then it has occurred here on the following dates: common from January to April 12, 1890; about fifty observed April 14, 1889; a few seen in 1904 at Ypsilanti; November 25, 1916, six seen in Ann Arbor; November 28, 1908, a few noted; from January 19 to March, 1911, a flock of twenty recorded by the writer about Ann Arbor feeding on the seeds of the ash maple; February 7, 1919, four were seen in Ann Arbor by the writer, and a flock of thirteen was observed in Ann Arbor on January 5, 1920, by A. D. Tinker.

Loxia curvirostra minor. CROSSBILL.—Covert, 1881, lists this specimen as "a very rare winter visitor." The writer's records are March 18 to 27, 1869; the winter of 1874; May, 1880, three shot in an orchard a few miles from Ann Arbor; March 31, 1885, a small flock seen in an orchard by the writer; March 26, 1883, Dr. J. B. Steere, collector; November 7, 1908, a flock of twelve seen feeding on the seeds of evergreens on the University campus; November 18, 1913, two shot from a small flock

near Ann Arbor; January 5, 1914, five birds seen in Ann Arbor, April 7, 1914.

***Loxia leucoptera*. WHITE-WINGED CROSSBILL.**—In 1881 Covert lists the species as a "rare winter visitant," but gave no record of its occurrence. The writer considers it rarer than the preceding species and has but four records since 1870. Dr. J. B. Steere collected one on March 26, 1883, at Ann Arbor. On November 5, 1899, three of these birds were seen on the campus extracting seeds from the cones of a small pine. They were near the ground and so tame that the writer could almost touch them. One was taken and six seen near Ann Arbor on January 19, 1907. On December 20, 1906, a single bird was found in a car loaded with wheat. This bird was kept alive until May; the plumage was oddly marked with feathers of greenish yellow. On July 31, 1916, a juvenile bird was found dead in the water of Douglas Lake, Cheboygan County, Michigan, this being the most southern summer record for Michigan. It may have been raised there as it was too young to have flown far. There is but one Michigan breeding record (Butler, *Birds of Indiana*, 1897, p. 922) for Delta County, Michigan, April 21, 1891.

***Pinicola enucleator leucura*. PINE GROSBEEK.**—This is a much rarer winter visitor in Washtenaw County than the Evening Grosbeak. The first record is a specimen in the Museum taken at Ann Arbor November 17, 1870. It occurred again in the winter of 1874-5. The writer has seen it only once: on December 23, 1913, a flock of about twenty stayed at Ann Arbor for some time feeding on frozen apples and buds of the evergreen; the last time they were observed being January 1, 1904. The only subsequent record is that of January 1, 1907, when two were seen and one specimen taken.

***Ammodramus savannarum australis*. GRASSHOPPER SPARROW.**—At Ann Arbor in 1881 this species was listed as a "rare summer resident," but it was not seen by the writer until May 11, 1895, when it was noted in a few meadows. It is now quite a common, though a local, breeder, and is found as far north as the "Saginaw Grand Valley."

***Passerherbulus henslowi*. HENSLOW'S SPARROW.**—In 1880 this species was listed as a "very rare summer visitor" at Ann Arbor. Our earliest specimen was taken May 26, 1894, and breeding birds were collected in the county near Manchester, June 23, 1917. The first specimen seen by the writer was a fine male found dead at Ypsilanti on April 18, 1908. Another specimen was taken on May 1, 1909, and two more were seen on May 16, in Ann Arbor. Each year since 1909 the species has increased in numbers and is now found breeding in several favorable localities. They have been reported from Eaton and Oakland Counties, the third tier of counties from the south.

***Chondestes grammacus grammacus*. LARK SPARROW.**—In 1880 this species was listed as a "rare migrant" at Ann Arbor, but the writer did not see it until April 20, 1895. Since that date several have been

noted in Washtenaw County, and it is now a rare resident all over the southern part of the state.

Spiza americana. DICKCISSEL.—This species was first observed in Washtenaw County in 1877, and again in 1903-4. On June 30, 1909, numbers were nesting in the meadows near Ann Arbor, but these were the last seen in the county. In 1899-1900 it was found breeding near Grand Rapids, in Clinton and Ionia Counties, seventy-five miles to the north. The species has now apparently withdrawn from nearly all of southern Michigan.

Vermivora pinus. BLUE-WINGED WARBLER.—This bird is a rare visitor or summer resident in southern Michigan. One was reported from Mackinac Island by S. E. White (Auk, X, 1893, p. 227). Three of the few noted in Michigan have been taken at Ann Arbor as follows: May 5, 1890, an adult male, in the writer's collection; May 1, 1896, an adult female taken by the writer; May 4, 1919, a fine adult male collected by Walter Koelz.

Protonotaria citrea. PROTHONOTARY WARBLER.—This southern species was first recorded from southwest Michigan in May, 1891 (Butler's Birds of Indiana, 1897, pp. 1922-1923). Since that date it has been found over most of the southern half of the Lower Peninsula and seems to be increasing in favorable localities. The writer first saw the nest of this species in a wet swamp about 20 miles northeast of Ann Arbor on May 8, 1896. It was not observed again until May 20, 1907, but since then it has become quite common along the Huron River, where it breeds in the swamps.

Wilsonia citrina. HOODED WARBLER.—Although Covert, 1881, says this species is "a rare summer resident" the writer can find neither the data nor the skins. Mr. Robert H. Wolcott observed it in Washtenaw County on May 13, 1887, and an immature female in the Museum collection was taken near here in 1880. The writer during fifty years of bird work in this vicinity has seen but one, an adult male found at the edge of the Huron River, near Ann Arbor, on April 7, 1912. On September 4, 1917, the writer noted both adults and young near Harbert, Berrien County, Michigan, where one was taken, August 31, 1917, by H. B. Sherman.

Opornis agilis. CONNECTICUT WARBLER.—This is another species which seems to be increasing in Michigan. On May 20 and 22, 1879, Charles Gunn recorded two (Nuttall Bull. IV, p. 186). At Ann Arbor the first one was taken by Covert, May 17, 1880. The writer's first specimen, an adult male, was taken September 9, 1896, and no others were seen in Washtenaw County until May 15 and 20, 1905. The following spring furnished the earliest spring record, May 2, 1906. In 1907 the species was observed on May 18, 30, and 31. On the last date the writer collected a pair. The last spring record for that year was June

6, when a female was seen at the "overflow," a dam on the Huron River near Ann Arbor. Other records are as follows: May 17, 1908, two seen; May 28, 1910, one seen; May 17 and September 20, 1912, one seen; May 8, 22, 23, 1913, one seen; May 25, 1918, one found dead on the University campus; September 14, 1918, one seen by A. D. Tinker. In September, 1919, Mr. Koelz found this species quite common near Alpena, Michigan; and the writer saw numbers of them along the Galien River in Berrien County the last week of May, 1918 and 1919.

Cistothorus stellaris. SHORT-BILLED MARSH WREN.—This is another species that has apparently extended its range northward in Michigan even to the south shore of Lake Superior. The writer found a colony in a wet marsh in Chippewa County in July, 1914. Local colonies occur about Ann Arbor, nesting in June in wet meadows, and more are being found each year.

Baeolopus bicolor. TUFTED TITMOUSE.—The writer's first record is October 7, 1878. On October 5, 1886, three were taken at Ann Arbor and a few have been noted at intervals since then as follows: January 1, 1898; October and December 1903, one seen by writer; March 24, 1907, one seen and a nest found by A. D. Tinker (Auk, Vol. XXV, pp. 322-323); observed January 2, 18, 26, 1916; February 4, and March 17, 1917; October 6, and 21, 1918. It is fairly common in Berrien County in southern Michigan.

GENERAL NOTES

An Oil-Soaked Loon (*Gavia immer*) at Watch Hill, R. I.—While walking along the beach at Pleasant View on July 30, 1921, I noticed a large water bird leaving the surf and hobbling up to the dry sand of the beach. In progressing the legs were of little aid, being used laterally in pushing the bird forward; the wings arched down till they acted on the sand much as crutches would with a person. Even the bill was utilized in this strange method of propulsion. First impressions were of a wounded cormorant, duck or some such waterfowl, but as we drew near, I saw that it was an immature Loon. Before we could secure it, however, back it went into the water, and diving into the nearest breaker, rapidly swam out before reappearing. Something, however, was amiss. The Loon described a large semicircle before getting very far out and returned to the beach one hundred yards or so away. Running to the spot we intercepted the bird and managed to secure a neck-hold so as to carry it to my cottage. Greasy hands soon told the story—the Loon had fallen victim to the heavy black oil that is taking such toll of marine bird-life of late

years. The bird was saturated with the oil; not a feather appeared natural, but each one was plastered down so as to be useless. After losing the first symptoms of fright, the Loon endeavored to preen its oil-soaked plumage. My wife, meanwhile, came to the rescue with several applications of lard, followed by warm rinsings. This restored the plumage to a more natural condition, the back and neck losing the dirty, greasy appearance, while the underparts came out a beautiful white. Apparently, however, it was too late. The Loon steadily failed and became weaker each hour. Its whole system seemed to be saturated with oil and the intestines gave evidence of a violent reaction. Twice we carried the bird down to the water that day, hoping it might recover in more natural surroundings. After a preliminary dive, however, the Loon would turn back to shore utterly exhausted; the breakers would practically wash it to land. The great problem was that of feeding and all of this had to be done by compulsion. As the bird grew weaker it became tamer and would allow its back to be stroked, and other handling with no attempt at fighting such as it showed at first. When we scratched its neck or back, the Loon made a little crooning noise and plainly showed its pleasure. After the second day it grew worse and died. A Wilson's Petrel was subsequently picked up on the beach with feathers similarly oil-soaked.

The changing over of many former coaling steamships and the building of the prevailing oil-driven type does not augur well for off shore birds. Nothing short of a rigid federal law relative to the disposal of waste oil at sea can save multitudes of our seabirds from destruction.—AARON C. BAGG, *Holyoke, Mass.*

Fish-catching by the Black Skimmer.—Having enjoyed the editor's privilege of reading Mr. Arthur's most interesting paper on the Black Skimmer which appears on the earlier pages of the present issue of 'The Auk,' some months before it was sent to the printer, I was naturally fully posted on the question at issue, and keen for any opportunity to watch the actions of the bird which might fall to my lot.

On July 17, 1921, while traversing the inland waterway some miles above Atlantic City, N. J., we encountered a few Skimmers one of which, skimming the surface in the ordinary way, passed between our motor boat and the black mud bank which loomed above the water at low tide marking the inner bank of the channel. The bird was not more than 35 feet distant and I caught and followed him with my binoculars. Just as he was opposite the boat he drove his bill into the water and seized a fish about three inches in length, holding it transversely between the mandibles, and flew off with it across the marsh. While this corroborates Mr. Arthur's statement as to the character of the Skimmer's food it demonstrates that it sometimes, though no doubt rarely, secures its food while skimming, a fact that had escaped his careful observation. I could think of no possible benefit to be derived by the bird from the unequal mandibles

when catching fish during flight. It was not "ploughing the main" at the time, and it would seem as if the peculiar bill must have been a hindrance to its success rather than an aid. My observation therefore in no way explains the peculiar structure of the bill but as a slight addition to Mr. Arthur's paper it seems worthy of record.—WITMER STONE, *Academy of Natural Sciences, Philadelphia*.

Laughing Gull (*Larus atricilla*) Captured by Snapping Turtle.—

While employed during the past summer on the collecting crew of the Marine Biological Laboratory at Woods Hole, Massachusetts, a very curious incident came to my attention. At the time, it did not occur to me that it was unusual, but at the suggestion of Mr. Henry W. Henshaw I am submitting this account for publication.

One morning in July, two of the collectors, Dr. H. B. Baker and Mr. Fred Erskine, while working at a fresh-water pond near Woods Hole saw a Laughing Gull (*Larus atricilla*) struggling violently in the water. It seemed as if something had caught it from below and was trying to draw it under. The men secured a boat at once and rowed out to the scene. Once, before they reached the spot, the gull was drawn completely under, but immediately came to the surface again. When the men reached it they pulled it from the water. Its captor, a large snapping turtle, with carapace nearly eighteen inches long, did not release its grip and was hauled from the water with the bird.

The abdomen of the gull was torn completely open and the viscera mangled, so the bird was immediately killed by one of the men. The dead bird and the turtle were brought to the laboratory. I had an opportunity to examine the former. It was an adult, apparently healthy, and with both wings sound. The turtle was killed and its stomach contents examined by a well-known physiologist, Dr. McCullom. No bird remains were found. Mr. Henshaw told me that it was very unusual for a gull to be caught unawares while sitting on the water unless it were diseased or injured. Such may have been the case here, but the evidence was not found. Whether or no, the vitality of the bird seems to have been very remarkable.—E. GORDON ALEXANDER, *Fayette, Mo.*

A Mating Performance of The Least Tern.—On May 27, 1921, I was puzzled by the behavior of some Least Terns (*Sterna antillarum*) at Carpinteria Beach, Santa Barbara Co., Calif., which were feeding small fish to other Terns apparently full grown. On May 31, at the mouth of the Ventura River, Ventura Co., Calif., I had an opportunity to observe the performance again at close range. It was evidently a mating performance. There were four or five pair playing about an estuary, pursuing each other and screaming. Occasionally one bird would bring up a small fish and then be joined by, or join, another bird, and after some aerial skirmishing and much screaming, both birds would alight on the

beach. The bird with the fish, which I assumed was the male, fed it to the female, and then for an instant stood with bill pointed upward, in an attitude similar to that of a mating Herring Gull.

I have been able to find no published account of this habit of the Least Tern. Mr. Harry Harris, however, has called my attention to an article in 'British Birds' (Vol. XIV, Sept., 1920) by Thomas Lewis, illustrating by photographs practically the same performance of the European *Sterna minuta*, a closely related species.—RALPH HOFFMANN, *Carpinteria, Cal.*

Brown Pelican in Oswego County, N. Y.—On December 21, 1920, there was taken at Richland, Oswego County, N. Y., an adult Brown Pelican (*Pelecanus occidentalis*) which evidently had been forced to alight because of exhaustion. The bird died on the 25th and it was not until the 27th that I was informed by the game protector that such a bird had been taken. I immediately visited Mr. Ernest V. Spink of Richland, at whose home the bird had been kept and there I learned that the Pelican was at Lacona being mounted by Mr. T. H. Elmer. The same day, I went to Lacona and saw the Pelican, which was mounted and drying. Mr. Elmer informed me that the bird was very emaciated and one leg showed an injury. The specimen was an adult in the post-breeding plumage, with the hind head and whole neck white with a tinge of straw-color. At present the specimen is in the New York State Museum at Albany, N. Y.—MILES D. PERNIE, *McGraw Hall, Cornell University, Ithaca, N. Y.*

Jaeger at Sandy Pond, Oswego County, N. Y.—On August 8, 1920, while observing shore-birds and Common Terns at the outlet of Sandy Pond into Lake Ontario I saw a Jaeger and observed it pursue the Terns for quite a period of time. I was able to watch it closely both in the air and while resting on the sand. It was in a very dark plumage or phase and showed white shafts to the primaries, giving the effect of a white patch in the wing when spread. The central tail feathers were elongated and acuminate. I was unable to collect the bird because at that time I had no collecting permit. However, from what details I could observe, I feel very sure the bird was a Parasitic Jaeger, (*Stercorarius parasiticus*), a species which has been seldom reported from the interior of New York State, and for this reason I consider the incident worthy of recording, in spite of the fact that the specimen was not taken.—MILES D. PERNIE, *McGraw Hall, Cornell University, Ithaca, N. Y.*

Double-crested Cormorant (*Phalacrocorax auritus auritus*) in Ontario.—From August 4 to 21, 1921, near Gargantua, Ont., north shore Lake Superior about 80 miles north of Sault Ste. Marie, Michigan, six of these birds were around the pound nets daily. The fishermen informed us these birds had been there since May.—M. J. MAGEE, *Sault Ste. Marie, Mich.*

Egret and Little Blue Herons at Elizabeth, N. J.—On July 31, 1921, I found three immature white Little Blue Herons (*Florida caerulea*) in the same small fresh water swamp near my home which was visited last summer by three individuals of this species as previously noted in 'The Auk.' The same day I discovered another white bird of the above species and an American Egret (*Casmerodius egretta*) feeding in a pond on the local salt marsh. On August 4 the number of Egrets had increased to nine. The marsh is supporting a good many marsh birds this summer in spite of the draining, ditching, and free use of oil by the mosquito commission. At least two Greater Yellow Legs (*Totanus melanoleucus*) remained here throughout the breeding season, also several Black Ducks (*Anas rubripes*), and one great Blue Heron (*Ardea h. herodias*), though all probably non-breeders.—CHARLES A. URNER, *Elizabeth, N. J.*

Egrets on the Potomac.—On the morning of August 4, 1921, between 8:30 a. m. and 9 a. m., while crossing the Potomac, on the highway bridge, I saw two Egrets. They were about two or three yards apart, sitting on floating logs. At first I paid very little attention to them, thinking them Gulls, but, as the car neared them, they straightened up, and I observed their long necks and legs. After sitting at attention for a few seconds they flew off, with their legs straight out behind them.

Again on the morning of the 5th, I saw the pair, and this time they flew to an island near the Virginia shore, formed several years ago, when the channel was dredged, and now covered with thick vegetation.—M. DORSEY ASHTON, *Alexandria, Va.*

Egret near Albany, N. Y.—An American Egret (*Casmerodius egretta*) was seen about thirteen miles west of Albany on August 3, 1921. The bird was feeding in company with seven or eight Great Blue Herons at the edge of the Watervliet reservoir.

We were able to observe the bird at short range with our binoculars for some time. The next day it was seen at a considerable distance, on the day following it could not be found, though those living near reported having seen it earlier in the day.

Doubtful reports have come to us from time to time of "White Cranes" in our vicinity. One is said to have visited Kinderhook Lake, about fifteen miles east of this city, last year. One is also reported to have visited the place where this Egret was seen about this same time last year, remaining for three or four days. Two are reported to have been taken within fifteen miles of the city within the last five years. These last reports are probably correct, but have not been verified as yet.—BARNARD S. BRONSON, *State College for Teachers, Albany, N. Y.*

Egrets near Schenectady, N. Y.—On Saturday, August 13, 1921, while hunting Indian relics with my wife, on the site of an old Indian vil-

lage, about two miles below Niskayuna, on the south bank of the Mohawk River, which place is situated about six or seven miles below Schenectady, we saw a pair of Egrets (*Casmerodius egretta*).

Again on Sunday, August 14, I visited Niskayuna with Mr. W. L. R. Emmet, of Schenectady, and Mr. B. S. Bronson, of Albany, and by boat we were able to get several good views of these birds, at one time approaching within 150 yards. We could distinguish quite clearly the black tarsi and the yellow beak and lores, thus thoroughly establishing identification. Upon returning to the village of Niskayuna, I was informed by the man who rents boats that two years ago two similar birds visited that region.

These aristocrats of the bird kingdom were quite exclusive, rather shy, and kept aloof from the Great Blue Herons, which are quite common in this locality. I am inclined to believe that the American Egret is not so rare a visitant to New York State as is popularly supposed.—LANGDON GIBSON, *Schenectady, N. Y.*

An Egret (*Casmerodius egretta*) on Long Island, N. Y.—At the mouth of Nissequogue River, near Smithtown, Long Island, N. Y., on July 22, 1921, I saw an Egret (*Casmerodius egretta*) flying out over the Sound and later the same day saw it alight in the marsh near by. The bird is sufficiently rare in that region to warrant recording this occurrence.—ARTHUR H. HOWELL, *Washington, D. C.*

***Aramus vociferus* and *Branta canadensis canadensis* in Florida.** On May 20, 1921, in company with H. H. Rast, the writer left Leesburg, Florida, in a motor boat, crossed Lake Griffin and descended the Ocklawaha River to the point where it empties into the St. Johns River. It required three days to make the trip. For the greater part of its length the river is bordered on both sides with a swamp often a mile or more in width. Formerly this region was noted for the large numbers of Limpkins to be found here. Various local hunters with whom I talked spoke of killing twenty or thirty of these birds in a morning. Today the species exists only in greatly reduced numbers. Eleven were seen during our trip and another called for a time one morning near our camp. Some of the birds were so tame they might easily have been shot from the boat.

Near Eureka, Marion County, on the morning of May 22, 1921, a flock of Canada Geese crossed the river. They were flying in characteristic formation and passed almost directly over us at an altitude of perhaps 100 feet, rendering the identification beyond question. Some fishermen later reported having seen one on the river the previous day. Two points of interest are attached to this observation. First, the Canada Goose is not often found in Florida, and second, the date would appear to be an unusually late one for this migratory species.—T. GILBERT PEARSON, *New York City, N. Y.*

Hudsonian Curlew and Golden Plover at Nantucket.—On May 13, 1921, my son, Capt. George H. Mackay, Jr., R. A. F., saw fourteen Hudsonian Curlew (*Numenius hudsonicus*) resting in a large field on Brant Point, Nantucket, Mass. They were very tame. This is the earliest record that I am aware of. From my earliest recollection these birds have been coming to the island, gradually diminishing in numbers until only a small remnant now returns; say some thirty birds or so. I infer that those now recorded are the progeny.

I have it on good authority that a gunner shot six young "pale-bellies", American Golden Plover (*Pluvialis dominicus dominicus*) on Nantucket about the middle of September, 1920. There were eight in the flock.—GEORGE H. MACKAY, *Nantucket, Mass.*

Occurrence of the Buff-breasted Sandpiper (*Tryngites subruficollis*) in Chicago Parks.—On April 27, 1921, it was my good fortune to observe a single individual of this species, in company with a pair of Spotted Sandpipers on the shore of the power boat harbor in Jackson Park.

On August 23, 1921, I was exploring the reclaimed land at the extreme north end of Lincoln Park, a place which seems to be a sanctuary for migrating shore birds, when I was surprised to come upon this species again. This time there were two birds and they were feeding in a grassy plain a short distance from the shore. These birds have remained and at the present writing (September 11) they are still to be seen at the same place. Since my first observation of the birds there, I have had the pleasure of pointing them out to Mr. J. D. Watson and Mr. Edward R. Ford.—GEORGE PORTER LEWIS, *4559 Forrestville Avenue, Chicago, Ill.*

Piping Plover Breeding in New Jersey.—On June 18, 1921, in the central part of the New Jersey coast, I found a pair of Piping Plover (*Charadrius melodius*) wearing an anxious mien. I retired to the top of a nearby dune and lay down in the long grass, and after a few minutes I noticed that running about with the old Plover were three fuzzy bumblebees on stilts. When I walked toward these downy chicks, they hid, but I caught one eventually, and it was about the cutest infant I have ever 'held.' No pinfeathers were visible. In scurrying over the beach before me, it held outspread its white, half-inch wings, like a running ostrich, only smaller. When caught, it was ever alert to escape, and would try to climb over my hands when I made of them a fence around it on the sand. One of its parents would run about with tail spread to the utmost and wings partly spread and quivering strongly, but if this was an attempt to play wounded and lure me away, it was not well done, for the bird kept at such a distance from me that I had to use my glass to observe clearly its attitude.

Some distance away, I met another adult Piping Plover, but it did not act as though breeding.

Dr. Witmer Stone, in his 'Birds of New Jersey' (1908) calls this species "A rare migrant, if indeed it occurs at all in the State." It may be that this occurrence indicates a coming return to our shore as a common breeding species, if unmolested. Let us give it a good chance, as it is a most charming little spirit of the sands.—CHARLES H. ROGERS, *Princeton Museum of Zoology, Princeton, N. J.*

Note on the Breeding of the Semipalmated Plover (*Aegialitis semipalmata*) in Nova Scotia.—In the October, 1920, number of 'The Auk,' on page 583, Mr. Harrison F. Lewis reports the finding of the eggs of the Semipalmated Plover and several pairs of this bird at Cook's Beach, Yarmouth County, Nova Scotia, and called attention to the fact that the third edition of the 'Check-List' states that this bird breeds south only to the Gulf of St. Lawrence. On page 597 of the same number of 'The Auk' I referred to my finding of the downy young of this plover at Seal Island off the southern point of Nova Scotia in July, 1920. In the same month on the shore of Barrington Bay near Coffinscroft, I found a Semipalmated Plover performing the wounded-bird act, showing it had young in the vicinity. On July 1, 1921, I found two pairs of this bird at Advocate, Cumberland County, Nova Scotia, whose actions pointed to their breeding at this place. It is evident, therefore, that the breeding range of the Semipalmated Plover includes Nova Scotia.—CHARLES W. TOWNSEND, M. D., 98 Pickney St., Boston.

An Unusual Dove's Nest.—While in the little town of Worthington, a suburb of Columbus, Ohio, on May 20 and 21, I observed a Mourning Dove (*Zenaidura macroura carolinensis*) setting on a nest, built on the pipe leading from the gas range, and within three feet of the range, just below and inside the window. This nest was about the height of a man's head, from the ground.

The original nest was built by a Robin early in the spring, when a rain storm blew it down. It was in rather an insecure place, being built on the top of a four-inch pipe, but the Robin immediately rebuilt the nest, and hatched out a brood of four. Immediately after hatching, the Dove took possession, and I was told by my friend, whom I was visiting, that she had been using it about ten days. This occurrence was rather unique to me. We often here see dove nests on the ground or very near it, but never in situations on the side of a residence as this was.—PETER A. BRANNON, *Montgomery, Ala.*

The Turkey Vulture in Michigan.—Occasional specimens of the Turkey Vulture (*Cathartes aura septentrionalis*) have been recorded throughout the State, though principally in the southern counties of the Lower Peninsula. Some have, however, been seen as far north as Delta

County, Upper Peninsula ('Michigan Bird Life,' W. B. Barrows, 1912, p. 255).

While trout fishing at Lovells, Crawford County, on the north branch of the Au Sable River, on May 10, 1921, Mr. W. B. Marshon saw a Buzzard flying over at such close range that the crimson of the head and neck could readily be seen. This is a sufficiently northern portion of the State to make this record of interest.—RUTHVEN DEANE, *Chicago, Ill.*

Short-eared Owl Nesting at Elizabeth, N. J.—On May 14 the writer found on the salt marsh near Elizabeth, N. J., a nest containing eight young Short-eared Owls (*Asio flammeus*). The birds showed considerable difference in size. Four had the eyes open and measured $4\frac{1}{4}$ – $5\frac{1}{4}$ inches in length as they squatted in the nest, and besides a coat of light cream or buff down they showed some feathering on the back with primary quills about an inch long. The other four measured $2\frac{3}{4}$ –3 inches, the eyes were shut and they showed only the downy coat. The four larger young were on one side of the nest, the smaller ones on the other.

The nest was at the edge of a scald or bare spot in a stretch of salt hay meadow. It was composed of but a handful or two of matted hay, in fact there seemed to be only a little more dead vegetation under the young birds than was to be found covering all the ground thereabouts. The place was foul with droppings and littered with feathers of various small birds but I found no pellets.

Two adult owls were in the vicinity, one of which I flushed ten yards from the nest and the other directly from the nest. No difference in marking to distinguish sexes was noticeable. The first bird flushed strove vainly by imitating injury and distress to draw me away, these exhibitions including sheer drops or tumbles from the air and flutterings and cries with wings outspread while on the ground. When not thus engaged the bird maintained a position directly overhead facing the wind. The second adult, when flushed from the nest, joined the vigil overhead. A third, attracted by the cries, appeared in the vicinity, but did not approach closely.

On my return on May 21 only four young, evidently the smaller ones of the previous week, remained in or near the nest. They had grown to a squatting length of about $5\frac{1}{2}$ inches. Three adults were again in evidence, two near at hand, the third appearing later at a distance. Returning on May 28 and June 4 the nest was empty except for one dead young owl and one large Pellet. One adult was flushed and its repeated simulations of injury indicated that the young were hiding in the grass nearby.

That the eight young represented two broods seems probable, but the eggs might not have been hatched in the same nest. On May 4 and 5 a heavy storm and an unusual tide flooded the greater part of this marsh. The spot where the young were found was not inundated and possibly

one or both broods, or young birds or as eggs, were carried from the flooded area by the parents to this haven of safety. This, of course, is mere conjecture.

So far as I have been able to determine this is the first nesting of the Short-eared Owl definitely recorded from northern New Jersey.—CHARLES A. URNER, *Elizabeth, N. J.*

Arkansas Kingbird (*Tyrannus verticalis*) in Maine.—Mrs. C. W. Alexander of Hallowell, Maine, wrote one of the members of the Stanton Bird Club of Lewiston, Maine, giving a description of a strange bird that she had seen, remarking that it looked like the picture of the Arkansas Kingbird. When I read in a recent 'Auk' of the appearance of this species in Massachusetts, I was able to help her identify the bird.

Following is Mrs. Alexander's account. "I got wonderful studies of the Arkansas Kingbird as it visited the yard of a friend on the next street and I saw it at close range several times, about four feet, through a window, and ten feet in the open. Head grey; back brownish grey, yellow feathers on rump but not conspicuous; wings brown, feathers edged with white making lines lengthwise on wing; tail dark brown, two outer feathers white; bill rather long, black or very dark, lower mandible reddish next to throat; throat very light gray almost white; breast buffy; belly decidedly yellow; feet and legs black. Length about nine inches. It changed plumage somewhat after its arrival. The olive tinge of the back became quite brown and the breast much duller. I could see with my glasses tiny fluffy grey feathers that obscured it and gave it a buffy appearance. It was tempted with all sorts of grain, raisins, apple, suet, and crumbs but the only food it was seen to take was the dried berries of the woodbine which it took on the wing in true flycatcher fashion. It seemed to regurgitate, for as it sat on the clothes reel, its favorite perch, it would throw something out that I was unable to find in the snow. It was reported to me about one week before I saw it on November 12, 1920. I saw it the last time January 15, 1921. On the latter occasion sleet was frozen on its tail and back and it was so benumbed that apparently it did not notice me. It disappeared that day and never returned".—CARRIE ELLA MILLER, *Lewiston, Maine.*

Blue Jay Feeding on Pecans.—During the past fall and winter, I have been very much interested in observing the Blue Jay (*Cyanocitta cristata florincola*), feeding on pecans in the yard of my residence. Within the enclosure of my back yard, is a large pecan tree, on which remain during the winter, a few pecans hardly worth gathering on account of their size, which drop off the tree during the winter months, and which form food for the Blue Jays.

I have often noted a Jay fly down into the yard, take a pecan in his claw, alight on the top of the fence, hold on to the fence with one

foot, with the pecan in the other, peck a hole in it, and where the meat cannot be pulled out, apparently suck it from the shell. This performance is often repeated until the bird secures a meal of these nut meats. We do not disturb them in this performance and apparently they frequent the premises for that purpose.—PETER A. BRANNON, *Montgomery, Ala.*

The Starling again at Cumberland, Maryland.—My friend and correspondent at Cumberland, Md., Mr. John A. Fulton, writes me that the Starlings again turned up in that city in February 28, 1921. They also followed the same tactics as last year, wheeling about the vine-covered Episcopal church, with the apparent intention of settling down in the vines, but the English Sparrows lodging there promptly went at them again and again, until the Starlings withdrew and settled down in some trees nearby. This was repeated for several days.—G. EIRIG, *Oak Park, Ill.*

Evening Grosbeak Breeding in Michigan.—For a number of years I have had a flock of Evening Grosbeaks (20 to 60) feeding at my house every winter. About the end of May the last one would disappear and none would be seen again until they reappeared the latter part of October to again spend the winter. Last spring Dr. Christofferson, my associate in bird work, and myself heard rumors that a number of Evening Grosbeaks had summered during 1920 near Munising Junction, some 115 miles west of the Soo, had been there all winter and were still there. The doctor visited the Junction June 1, 1921, and saw six of the Grosbeaks. The station agent stated the Grosbeaks had been around all the previous winter and summer. The doctor arranged with the agent to keep track of the birds this summer and again visited the Junction, September 4. He saw twenty, including a number of young birds and on September 9, eleven. The agent informed him he had kept track of the birds and they had been around all summer.

Early in July we had reports that Evening Grosbeaks were at Hulbert, some forty miles west of the Soo. July 17, 1921, the doctor and I visited that locality. We only had an hour between trains. We did not see any birds but were told by several people the Grosbeaks had been there that morning, were there almost daily and had been there all the previous winter.

August 24, while at breakfast a male Evening Grosbeak came in to one of my feeding boxes. The next day there were three males, two females, and one young in immature plumage and hardly able to fly. August 26 I saw two very young birds. There are ten or a dozen birds in the flock and they are still here September 10.—M. J. MAGEE, *Sault Ste. Marie, Mich.*

Albinism in the Sharp-tailed Sparrow (*Passerherbulus cauda-*

cutus).—A series of fifteen specimens of this species taken by me since 1900 and up to 1921 in the autumn and winter, and within 300 to 400 yards of my house, show albinism varying from one or more white feathers in the tail or wings to beautifully mottled birds with white prevailing on the head and back; very few white feathers, however, are present on the under parts and, in most cases, are absent.

All of these specimens, which are now in my collection, are spotted with blackish in the abdominal and ventral regions, the specimens showing the most white in the normal feathers have invariably the most black spots while in those that show only one or two white feathers in the tail or wings the spots of black are reduced to a minimum. Several specimens have the tail feathers and dorsal feathers greatly lengthened with an appendage-like feathering and which I have only found in this species.

An albinistic Seaside Sparrow (*Passerherbulus marilimus marilimus*) taken by me on November 11, 1915, and at the same locality, has the black spotting confined to the sides, only, the abdominal and ventral region being white and without any spotting as is invariably not the case of the Sharp-tailed Sparrows that show albinism.

This strain of albinism in the Sharp-tailed Sparrow has held uninterruptedly year after year on this little realm, which embraces only a few acres of high land, to which large numbers of birds such as the Sharp-tailed, Acadian, Nelson's, Seaside, and a few Macgillivray's Seaside Sparrow repair at high water or principally at the advent of spring tides, and where I have seen in a single season no less than three albinistic Sharp-tailed Sparrows.

Since 1900 I have taken about twenty-five Sharp-tailed Sparrows on this little piece of land, all of which showed albinism in a greater or lesser degree, and all taken exhibited the black spots on the abdomen. On February 12, 1918, I picked up a pure white mummified Sharp-tailed Sparrow on "Eagle Island," which is about two and a half miles from my house. This bird without doubt succumbed to the intensely cold weather that prevailed in January, and is the only perfect albino I have ever seen.
—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

The English Sparrow and the Motor Vehicle.—In 'The Auk' for April, Dr. W. H. Bergtold has recorded an interesting chapter in the history of the English Sparrow, which might forecast a much to be desired reduction in the ranks of that pest. From the observations I have recently made in eastern Oregon, I am not at all sure that there is any real reduction.

It is generally conceded that the empty grain cars have been the chief means of distributing this species, which has until late years confined its habitat to the cities or the more densely populated sections adjacent.

So closely did the species adhere to the lines of the railways that many of us began to think that farming sections, of the west at least, might be

spared its visitation. If such was the condition a few years ago it surely is not true today, as a trip through the sage brush sections of eastern Oregon will prove.

Some ten years ago I noted an English Sparrow about ten miles south of Vale, Oregon. At the time this was so far from the usual range of the bird that I made note of the case. The species was very abundant in Vale, but none were seen even a mile from the streets. A year or two later they were to be found among the ranches, as far as Ironside, some fifty miles from Vale and half that distance from the railroads. Within two years they were abundant about every barn in the Ironside section, except where they were driven away by use of the shot gun.

In late May, of this year, I drove by auto from Vale to San Diego, via Burns, Oregon. Burns is some 100 from the nearest railroad and the ranches between are few and widely scattered. English Sparrows were seen by thousands in Burns, and to get there they must have passed over many miles of sage brush and barren hills, where no human habitation offered food or shelter. Without doubt the species is becoming rapidly a resident of the ranch lands of Eastern Oregon. It would be interesting to learn to what extent it is abandoning the city for country life, whether the reduction in its ranks in Denver is due to fewer birds or merely a moving to the rural sections. The reasons given by Dr. Bergtold, for the decrease in the numbers in Denver, are very logical and, I think may be duplicated in most of our cities. How about the adjacent farms?—A. W. ANTHONY, *Natural History Museum, Balboa Park, San Diego, Calif.*

Goldfinches and Purple Finches Wintering at Hatley, Stanstead County, Quebec.—For the second time in the past eleven years Goldfinches (*Astragalinus tristis tristis*) have again spent the winter here (1920-21), and Purple Finches (*Carpodacus purpureus purpureus*) have likewise done the same thing, this however being the first occasion of their doing so during the above period, the previous occasion of the Goldfinches being in 1915-16. It may not be generally known that the Purple Finch is much addicted to eating salt, which accounts for its almost constant appearance in my garden of late years, there being a small trough just outside the fence where my landlord keeps salt for his cattle. It had puzzled me for some time why the birds were so fond of this particular spot until I read in 'Bird-Lore,' Vol. XXII, 1920, p. 286, of House Finches (*Carpodacus mexicanus frontalis*) being addicted to this same habit, when the mystery was solved. It has also been recorded in the same magazine for March-April, 1921, pp. 90-91, how English Sparrows, Mourning Doves, Crows and some other common birds have been seen round a trough in a pasture apparently picking up grains of salt. Chickens are also said to eat it greedily.—H. MOUSLEY, *Hailey, Que.*

Nonpareil (*Passerina ciris*) in Pennsylvania.—On May 16, 1921,

three miles due south of Mercersburg, Pa., on a country lane, I positively identified a male Nonpareil, in full plumage. The bird was first seen in a hedge of osage orange; thence it flew to a locust tree, where it was carefully observed. It behaved and looked like a wild bird and not like one that had escaped from captivity. With the Painted Bunting I have been familiar since boyhood, when I used to know it well at my home on the South Carolina coast.—ARCHIBALD RUTLEDGE, *Mercersburg, Pa.*

The Philadelphia Vireo (*Vireosylva philadelphica*) in the Province of Quebec.—At the conclusion of his interesting paper in the April 'Auk' on the breeding of this species at Bergerville near Quebec, Mr. Harrison F. Lewis remarks that he has only been able to find two records of the bird's occurrence in the Province, both of which date back many years ago. May I be allowed to draw the attention of Mr. Lewis as well as that of other readers to the fact that at least nine examples have been recorded by me at Hatley, during the past few years, one on August 23, 1918, and eight during September and October, 1919. Out of these latter, two were obtained, one going to the Victoria Memorial Museum at Ottawa, the other still being in my possession, see 'Auk' Vol. XXXVI, 1919, p. 486, and 'Auk', Vol. XXXVIII, 1921, p. 53. Last year (1920) I did not see a single example either during the spring or fall migration. It will be noticed that with one exception all the birds seen by me were in the fall of 1919, the year they bred at Bergerville.—H. MOUSLEY, *Hatley, Que.*

Golden-winged Warbler at Sault Ste. Marie, Mich.—On September 4, 1921, at West Neebish, St. Mary's River about twenty miles southeast of Sault Ste. Marie, Michigan, I saw a male Golden-winged Warbler (*Vermivora chrysoptera*), the first I have ever seen in the Upper Peninsula of Michigan. I believe this to be the most northern record for this warbler in Michigan, certainly for the eastern portion.—M. J. MAGEE, *Sault Ste. Marie, Mich.*

Golden-winged Warbler in Kansas.—On May 2, 1921, I collected a female Golden-Winged Warbler (*Vermivora chrysoptera*). It was taken in the lower trees of some dense woods along Wakarusa Creek, in Douglas County, Kansas. The specimen is preserved in the Kansas University Museum.—E. RAYMOND HALL, *Haskell Institute, Lawrence, Kansas.*

The Kentucky Warbler in Clarendon County, South Carolina.—Although the Kentucky Warbler (*Oporornis formosa*) is fairly common during the summer near Summerton, South Carolina, it was not until last year (1920) that I found evidence of its breeding. The earliest date that I have for its arrival in the spring is April 28, 1909, but I am unable to say how long it remains in the fall.

This warbler inhabits the heavily-timbered swamps. Its movements on the ground are quick and graceful and much resemble those of Swainson's Warbler. It is a persistent singer and its song so closely resembles the "ter-whee" chant of the Carolina Wren that a novice could easily mistake it.

On June 29, 1920, I was doing field work on the edge of a large swamp, two miles from my home. Among the oak and hickory trees that bordered the denser growth, a Kentucky Warbler was heard singing. He was among the lower branches of a poplar, about twenty feet up. A little further on the female was encountered: her nervousness and incessant chipping arousing my suspicions I watched her closely. She soon emerged from the grass with a worm and took it to an oak sprout, under which was a young bird, just able to fly. He had been only a short time out of the nest.

During the present year I did not visit any swamps until May 17, when a male was heard singing. On May 27 in another swamp, a young bird was seen, which was unable to fly: I caught and examined him. In the meanwhile the female trailed over the leaves, feigning a broken wing, and came within a foot or two of me. The male kept some distance away.

On June 10, 1921, a nest with four young was found. It was a quarter of a mile from the spot where I saw the young bird on May 27, and in the same swamp, near the stream which flowed through the swamp, I heard the loud, sharp clipping of *formosa*. Both birds had food in their bills. I retreated a short distance and quietly watched them. The female almost at once flew down to the base of a sapling and came up empty handed, so to speak. The male, more suspicious, perched on a low branch, twisting about and chipping. Not until the female came again with food did he muster courage to drop to the nest.

This nest was set flatly on the damp ground, at the base of a little sweet gum bush, and no attempt was made to conceal it; built of leaves with the stems pointing outward; lined with pine needles and black, hairlike fibers. The eyes of the young birds were just opening. This nest I now have in my collection.

Little seems to be known of this bird in South Carolina though it has been recorded as nesting in the counties of Greenville, Pickens, and Aiken. Mr. A. T. Wayne, the well-known authority, who resides at Mt. Pleasant, South Carolina, informs me that the Kentucky Warbler does not breed anywhere on the coast of the State. It is an uncommon bird in spring, he says, and most of his records are fall ones.

In view of the fact that all of my records were made in a limited area, this bird should prove to be, upon further search, a plentiful species as well as a common breeder.—E. von S. DINGLE, *Summerton, S. C.*

Mockingbird and Catbird Wintering at Cumberland, Maryland.

—Mr. John A. Fulton of Cumberland, a very capable observer, writes me that on January 23, 1921, he heard and saw a Catbird in a thicket near the city, and that a Mockingbird wintered in the shrubbery around a residence in "The Dingle," an outlying residence district of the city.—G. EHRIG, *Oak Park, Ill.*

Early Spring Records at Hatley, Stanstead County, Que.—I suppose the very early and abnormal spring of 1921 has been the means of creating innumerable ornithological, as well as entomological and botanical records. Most of the early wild flowers are at least a fortnight in advance of previous years, and amongst the birds the following are ahead of any previous records during the past eleven years, viz.: Bittern (13 days), Wilson's Snipe (14), Red-shouldered Hawk (10), Belted Kingfisher (5), Ruby-throated Hummingbird (7), Rusty Blackbird (12), White-throated Sparrow (6), Cliff Swallow (8), Black and White Warbler (4), Black-throated Blue Warbler (2), Ruby-crowned Kinglet (6), Bluebird (8). At the time of writing (May 14) the real warbler wave has not yet set in, the only species present being males of the Black and White, Black-throated Blue, Myrtle, and Black-throated Green.—H. MOUSLEY, *Halley, Que.*

Unusual Winter Occurrences at Chicago.—The last unusually mild winter (1920-21) had some curious effects on the movements of several species of birds. There was an invasion of the Arctic Three-toed Woodpecker (*Picoides arcticus*) if the seeing and reporting of about fifteen specimens may be so termed. They appeared in October, despite the warmth of this month, and were seen in many places in and about the city. I saw three in one day at Millers, Indiana, in the dunes, on November 26, 1920. The previous winters we had the Bohemian Waxwing, the Evening Grosbeak, both in numbers, the Pine Grosbeak, the Crossbills, and the Redpolls, and now the Three-toed Woodpecker. We must be getting an arctic reputation among the birds up north.

A belated Lincoln's Sparrow was secured by Mr. S. S. Gregory at Beach near Waukegan, on December 26, 1920.

At the same place a Black-crowned Night Heron in immature plumage was shot on January 4, 1921.

Harris's Sparrow (*Zonotrichia querula*) seems to be shifting its migration routes farther east, at least it is seen more often of late. Mr. H. L. Stoddard saw one in Jackson Park in September, and took several in the Sand Dunes, Lake County, Indiana.

A shifting of breeding range northward, probably owing to the mildness of the winter, seems to have occurred in the case of the Tufted Titmouse, at River Forest. About eight of them came into Thatcher's Woods there, during the winter, and in April were seen inspecting holes in the trees.

On May 11, 1921, a Red-bellied Woodpecker (*Centurus carolinus*) was seen in the same wood and was noted by several observers for about a week. This and one last year, seen at Addison, are the only ones I ever observed here.

A Mockingbird (*Mimus p. polyglottos*) stayed about my house all day on May 21, 1921. Several more were reported at the same time from the neighborhood. This is the second one I have seen during my twelve years' residence in northern Illinois.—G. EFRIG, Oak Park, Ill.

Additional Notes on Arkansas Birds.—Since writing my paper on the 'Birds of South-eastern Arkansas' (Auk, July, 1921), I spent two weeks—September 24 to October 8, 1920, at Chicot, Chicot County, and while there observed several species not listed before which it might be well to mention here. Chicot is the southeasternmost county of Arkansas and the character of the country is similar to that of Deshea and Drew Counties. At this season the cotton was being picked and ginned and during the first week of my stay the temperature ranged around 100° F. to 110° F.

The Mockingbirds were ever the persistent singers even during the noon-tide, under this blazing sun, and the Carolina Wrens sang in spite of the heat. On October 3 the weather turned cool and from then on was delightful.

Migrating warblers thronged the cypresses along the Bayou Mason. I listed the Tennessee Warbler (one im. collected September 26); Black and White Warbler (one collected September 25); Redstart (one collected September 26); Magnolia Warbler (one im. collected September 26); Blackburnian Warbler (October 4); and Black-throated Green Warbler (October 4).

Turkey Buzzards and Black Vultures were abundant and Red-shouldered Hawks were common. The Barred Owl, Great Horned Owl, and Screech Owl were heard calling. One Black-crowned Night Heron was heard; the Green Heron was seen along the Bayou Mason and one small white heron which I failed to identify. I was told of a swamp west of Chicot, along the Bayou Bartholomew where more White Herons or "cranes"—some with plumes and some without plumes—are said to nest than at any other point north of Louisiana. I was really surprised at not seeing numbers of White Herons during my stay but one of our men who had spent the whole year in this section told me that he never saw one although he is familiar with these birds in Florida.

The Bald Eagle is said to have nested recently near Lake Chicot. The Anhinga is said to spend the winter on Grand Lake and the White Pelican has been seen there.

Catbirds were common during my stay and numbers of Yellow-billed Cuckoos were seen. Crows were fairly common; several Kingbirds and Acadian Flycatchers were noted; also the Wood Thrush and Bluebird

were about in numbers but the Robin was conspicuous by its total absence.—CHRESWELL J. HUNT, 5847 W. Superior St., Chicago, Ill.

Early Bird Banding.—It may be of interest even at this late date to know that at Carberry, Man., in Dec., 1882, and Jan. and Feb., 1883, I marked a dozen or more Snowbirds with a black spot of printer's ink on the breast and let them go. Hoping to find out whether the species was continually migrant in the winter, or whether the same individuals stayed about our barnyard throughout the blizzard time. As I never saw any of them again I suppose they kept moving on.

On May 21, 1884, at Carberry, Manitoba, I caught a male Sparrow Hawk and let it go with a microscopic locket on its neck, in which was a note asking the finder to communicate with me. On July 8 I similarly tagged a young Robin. I wonder if any reader chanced to run across one of these.—ERNEST THOMPSON SETON, *Greenwich, Conn.*

RECENT LITERATURE

Chapman on Bird Life in the Urubamba Valley, Peru.¹—The basis of the present paper is a collection of birds made by Edmund Heller as naturalist of the expedition of Yale University and the National Geographic Society under the direction of Prof. Hiram Bingham, supplemented by a collection made by Dr. Chapman and Mr. Geo. K. Cherrie, July 1–24, 1916, and material obtained later for the American Museum by Harry Watkins.

Dr. Chapman's short visit to the region was made as a side trip on a more extended tour of South America, for the purpose of gaining a personal knowledge of the region visited by Heller, whose collection he had been asked to describe. His report, he states, is primarily a contribution to a biological survey of the Andean system, more especially a comparative study of the origin of the bird life of the Temperate and Puna Zones, being thus a continuation of the investigation so ably begun in his well known 'Distribution of Bird Life in Colombia.' His conclusions are that the Tropical, Subtropical and Temperate Zones of the Urubamba district are essentially the same as the corresponding zones in Colombia, and inhabited by much the same species, but that the Puna (Paramo) Zone

¹ The Distribution of Bird Life in the Urubamba Valley of Peru—A Report on the Birds Collected by the Yale University-National Geographic Society's Expeditions. By Frank M. Chapman of the American Museum of Natural History. Bulletin 117, U. S. Nat. Museum. Washington, 1921, pp. 1–138; pll. 1–9.

of Peru being much more extensive and much closer to the Patagonian sea level fauna from which its fauna is derived presents a marked difference in character.

Interesting lists of species of the several zones have been prepared showing the distribution of both genera and species. From these we see that 57 per cent of the species of the Puna Zone are endemic as compared with 80 per cent of those of the Temperate Zone. The difference, as Dr. Chapman points out, is probably due to the greater differentiation in the life of the latter Zone, which was evidently derived from the Tropical Zone and has probably passed through a Subtropical stage, whereas the life of the Puna Zone is but slightly differentiated from the South Temperate of Patagonia.

The introductory pages contain also full descriptions of the various localities visited with excellent illustrations from photographs.

The list includes all species reported from the Urubamba Valley, 380 in number, with annotations on those represented in the collections studied by the author. Thirteen new species and subspecies obtained by the expeditions have already been described by Dr. Chapman and in the present paper he proposes three others *Aratinga mitrata alticola* (p. 62), *Siptornis modesta proxima* (p. 83), and *Ochthoeca lessoni tectricialis* (p. 88).

The paper forms another valuable contribution to Neotropical ornithology the problems of which are being rapidly elucidated by Dr. Chapman's researches. In closing our review we cannot refrain from quoting a paragraph which reflects so admirably upon the present day craze for new genera and the desire of many writers, who know nothing about the questions involved to be "up to the minute" in their nomenclature! Dr. Chapman says: "Generic subdivision in ornithology nowadays is so unstandardized and in many cases is so largely a matter of opinion, that it seems unwise to change long-established terms until opportunity has been afforded to weight the evidence on which the new or revived genera in question are recognized."—W. S.

Wollaston's 'Life of Alfred Newton.'¹—To the average ornithologist the name of Newton is at once associated with the 'Dictionary of Birds' and those who make use of this work as they should, cannot but be impressed not only by the profound knowledge of birds and their literature, which the author possessed, but by his mastery of the English language, which enabled him to embody such a wealth of information in such a relatively small space. Newton is also known through his 'Ootheca Wolleyana', another masterly piece of English composition and reservoir

¹ A Life of Alfred Newton, Professor of Comparative Anatomy, Cambridge University, 1866-1907. By A. F. R. Wollaston, with a Preface by Sir Archibald Geikie, O. M., with illustrations. London, John Murray, Albemarle Street, W. 1921, pp. i-xiv. + 1-132. Price 18 shillings.

of information on the breeding of Palaearctic birds, published as a memorial to his friend and colleague, John Wooley, and also as a contribution to the study of birds' eggs, a branch of ornithology to which a large part of Newton's life had been devoted.

To British ornithologists Newton's name will ever be associated with the B. O. U. of which he was one of the founders—if not *the* founder since the original meeting was held in his rooms at Cambridge.

It is fitting that a man of Newton's eminence in his chosen field should be properly memorialized and the recent volume by one of his former students, Mr. A. F. R. Wollaston, places on record, in a satisfactory manner, the main events of his life and gives a clear idea of his character and personality. In style the biography is perhaps not all that we might desire, since the subject matter seems to be rather carelessly thrown together and lacks continuity, so that the charm that many biographies possess in their well sustained narrative is to some extent lost. This is due in large measure to the long delay and interruptions in preparing the volume, to which the author was compelled to submit through force of circumstances, and to the final necessity of cutting down his manuscript to about one half of its original length.

Alfred Newton, we learn, was born on June 11, 1829, the son of a Norfolk squire, and was educated at Cambridge University, where in after years he became Professor of Zoology and Comparative Anatomy. He obtained a travelling scholarship at the University which enabled him to gratify his great ambition to travel in Lapland and Iceland to investigate the breeding habits of the birds of these northern countries, while later he visited the West Indies and the United States, in pursuit of bird lore and birds' eggs. In early life he suffered an accident which left him lame and this led later to another mishap which aggravated his affliction, but in spite of all he continued his active life bearing with remarkable fortitude the great handicap that had been placed upon him. He had the qualifications of a great explorer and had it not been for his affliction would undoubtedly have made a name for himself in this field.

Between Newton and his brother Edward there existed the deepest affection which stands forth as one of the beautiful features of his life. Their interests were largely identical and when separated they wrote to one another every day, or by ever mail when one of them happened to be out of the country.

Newton's conservatism is evident in everything connected with his life—his views upon most subjects, his personal habits, attire, etc., but curiously enough we find him among the first to adopt the ideas of Darwin and Wallace on evolution and one of their staunch supporters in the stormy discussions which rent the British Association in the early sixties.

Newton was dearly loved by those who came into personal contact with him at Cambridge and his kindness to young ornithologists extended

far beyond the confines of the University town, or even the boundaries of Great Britain, as the present writer can testify.

Sir Archibald Geike in a preface to Mr. Wollaston's biography sums up Newton's character as follows: "His perennial bonhomie, his youthful enthusiasms maintained up to the last, his inexhaustible fund of anecdote and reminiscence, his unfailing good humor, his love of work, and his generous co-operation in the doings of every fellow-worker who needed his help, together with the amusing predicaments in which his conversation sometimes placed him combined to make a rare and delightful personality;" and the author closing his personal estimate of the man says: "When once you were a friend of Newton's you were always his friend. He was possessed of the old-fashioned courtesy of manner, and a certain leisureliness of habit, which made a visitor feel that he was not trespassing upon the time of his host. Both in appearance and in character he had the finest attributes of the old race of English country gentleman, to which by birth he belonged."

Newton's name and influence are indelibly impressed upon the history of ornithology and present day students of his favorite science will do well to read carefully the volume which Mr. Wollaston has brought together as they are bound to gain inspiration from the history of the life that is there set forth.—W. S.

Stresemann, on the Woodpeckers of Sumatra.¹—The various Sumatran species are considered in relation to the forms inhabiting Malacca, Java, and Borneo, etc., and the applicability of Steere's law is discussed. Under each species are paragraphs dealing with distribution biology and differentiation into races; then under the Sumatran race of the species are discussed, its characters; sexual differences; plumage of the young; distribution; biology; and observations.

The following new forms are described *Picus vittatus limitans*, (p. 74), East Xangean; *Collocalophus miniatus dayok* (p. 82), West Borneo; and *Dinopium javanense palmarum* (p. 93) Sumatra.

At the close of the paper there is a summary of the author's detailed study, under the following headings: zoogeographic consideration, geographic variation in color, ontogeny of coloration and sexual dimorphism, molt and number of eggs. The paper is admirably planned and data of much interest and importance are presented.—W. S.

Rothschild, on Birds of Yunnan.²—A collection made by George Forrest for Col. Stephenson Clarke, contains representations of 278 of

¹ Die Spechte der Insel Sumatra. Eine monographische Studie. von Dr. E. Stresemann. Archiv. f. Naturg., 87, abt. A., Heft 7. June, 1921, pp. 64-120.

² On a collection of Birds from West-central and North-western Yunnan. By Lord Rothschild, Novit. Zool., XXVIII, May, 1921, pp. 14-67.

the 496 species of birds known from Yunnan. Twenty forms are here described as new, a few of them being from other localities or other collections.—W. S.

Hartert on the Birds of Capt. Buchanan's Expedition to Air.¹—

The collection here described is of absorbing interest as not a single specimen had previously been collected in this mountainous region of the central Sahara. They prove that the bird fauna of the region is tropical and it is now possible to fix the boundary between the palaearctic and tropical African fauna at approximately the 20th degree of north latitude. In discussing this question Dr. Hartert points out the fact that the origin of a species has nothing to do with its value in determining geographic relationships of faunas, where its present day distribution is the important point. This has been misunderstood by more than one writer.

The author contributes a most interesting preface referring to his early realization of the importance of exploring the Air district and the long delay in its accomplishment. Then follows a well annotated list of the 167 species and subspecies obtained by Capt. Buchanan's expedition, 13 of which are described as new.

A number of excellent illustrations give one a good idea of the appearance of this interesting region.—W. S.

McGregor on Birds of Panay.²—Mr. McGregor in this paper describes a trip to Antique Province on the western side of the island of Panay, P. I., undertaken in 1918. Eighty-eight species were seen or secured, of which eighteen seem to be new to the island. There are numerous annotations of interest regarding the habits or relationship of the species.—W. S.

Murphy on the Seacoast of Peru.³—Dr. Murphy's sixth paper on his Peruvian expedition treats of a visit to the island of San Gallan. It is graphically written and is particularly interesting to the ornithologist, on account of the references to the Condor and the numerous illustrations of this noble bird in flight as caught by the camera.—W. S.

¹ The Birds Collected by Capt. Angus Buchanan during his Journey from Kano to Air or Asben. By Dr. Ernst Hartert. *Novit. Zool.* XXVIII, May, 1921, pp. 78-141.

² Birds of Antique Province, Panay, Philippine Islands. By Richard C. McGregor. *The Philippine Journal of Science*, 18, No. 5, May, 1921.

³ The Seacoast and Islands of Peru. By Robert Cushman Murphy. VI. San Gallan. *The Brooklyn Museum Quarterly*. July, 1921, pp. 91-105.

Over and Thoms on the Birds of South Dakota.¹—This well printed bulletin consists of two parts the first dealing with "Bird Study" and the second consisting of a list of the birds of the state with brief descriptions, while there are numerous excellent illustrations of birds and nests, from photographs from life.

Part I, contains brief and for the most part reliable data on various phases of economic ornithology, protective coloration, molt, and migration covering such questions as are likely to occur to the beginner. The explanation of seasonal changes of plumage on the grounds of protective coloration however does not seem satisfactory and the intimation that the male Goldfinch changes color in spring without a molt is contrary to the evidence furnished us by almost every museum collection. The list includes 322 species and subspecies and seems to have been carefully compiled, while doubtful specimens have been determined by the U. S. Biological Survey. The authors are to be congratulated upon their work which cannot help but fill a widely felt want and will lead many a would-be bird student to a better knowledge of ornithology.

It is regrettable that such an excellent bulletin should be marred by such a carelessly prepared bibliography. There is no uniformity in the citation of the papers and books, and from the information given it would be absolutely impossible to find many of them. "U. S. Geological Survey," and "State Game and Fish Com. Minneapolis" are not very definite references for one seeking certain publications.—W. S.

Dwight and Griscom on *Atlapetes gutturalis*.²—A careful study of much fresh material from Central America shows that five races of *Atlapetes gutturalis* are recognizable, three of which are here named for the first time: *A. g. parvirostris* (p. 3) from the Highlands of Costa Rica; *A. g. fuscipygius* (p. 3) from north central Nicaragua and *A. g. griseipectus* from Central Guatemala. The authors call attention to the fact that in old skins of this species, the color turns brown as in certain others already referred to by Dr. Chapman, so that they are useless for subspecific comparison.—W. S.

Witherby's 'Handbook of British Birds.'³—The eleventh part of Mr. Witherby's book completes the raptorial, and covers the storks, ibises, herons, swans and geese. There is an excellent colored plate of the bills

¹ Birds of South Dakota. By William H. Over and Craig S. Thoms. Bulletin 9. South Dakota Geol. and Nat. Hist. Survey. Series XXI, No. 9. March 1921. Bulletin Univ. of South Dakota. pp. 1-142. Many half-tones and colored frontispiece of Meadowlark.

² A Revision of *Atlapetes gutturalis* with Descriptions of Three New Races. By Jonathan Dwight and Ludlow Griscom, American Museum Novitates. No. 16, pp. 1-4, Sept. 9, 1921.

³ A Practical Handbook of British Birds. Edited by H. F. Witherby Part XI. pp. 177-256. July 18, 1921. Price 4s. 6d. net per Part.

of the last two groups, and the usual pertinent text figures, including interesting diagrammatic sketches of the vultures in flight as viewed from below. While the nomenclature is in the main in accord with that of the A. O. U. 'Check-List' we notice that the egrets are all referred to *Egretta* and the swans to *Cygnus*, a treatment which we would heartily endorse. The snow geese are united with *Anser*, with perhaps less warrant, and the validity of *Anser albifrons gambeli* and *Branta bernicla glaucogaster* are questioned.—W. S.

California Hawks: How to identify them.¹—This is a commendable attempt by Dr. H. C. Bryant to make possible the field identification of hawks by the average citizen. One key is given which is based on mode of flight, habits and general appearance, illustrated by outlines of flying birds of the four principal groups of hawks, and another, taking into account size and general coloration. The habits and economic value of hawks are concisely discussed with a modicum of illustration from California instances. The page of bibliography given will enable those so desiring to pursue the subject further. It is to be hoped that wide distribution of separates of this paper can be secured, and similar publications are much needed in all States. The general antipathy to hawks seems almost ineradicable, witness the fact that today bounties on these birds are specifically authorized in five of the States of the Union and may be paid in as many more.² Under the circumstances the more truth disseminated about these birds, the better.—W. L. M.

The Ornithological Journals.

Bird-Lore. XXIII, No. 4. July-August, 1921.

The Yellow-breasted Chat and the Cowbird. By Wilbur F. Smith.—Describes a nest in which two young Cowbirds were raised by a pair of Chats. Usually Chats are supposed to desert a nest if a Cowbird's egg is deposited in it. The author voices the general condemnation of the Cowbird. Its peculiar parasitism is however one of the provisions of nature and why mankind should be expected to interfere in such cases is not quite clear. It would seem to be quite as cruel to kill a young Cowbird as a young Warbler or Sparrow.

The Mockingbird of the Arnold Arboretum. By C. H. Early.—Carries the history of this notable bird so fully described by the late Horace W. Wright (Auk, July, 1921) on for another year.

The Bird Bath in Molting Time. By Craig S. Thoms.—Considers an abundance of water a necessity at this time in the bird's life. A number of interesting photographs are presented.

¹ Calif. Fish and Game, Vol. 7, No. 3, July, 1921, pp. 133-147, figs. 42-49.

² colored plates.

³ See Farmers' Bull. 1238, Sept., 1921.

The Cowbird: A Parasite. By Harry E. Elder.—A valuable contribution to the history of the species and another call to upset nature's balance and destroy him.

The migration and plumage papers deal with the Grackles.

The Condor. XXIII, No. 4. July-August, 1921.

The Storage of Acorns by the California Woodpecker. By Henry W. Henshaw.—An interesting supplement to Prof. Ritter's paper in the January-February issue while the similar habit in the Red-head is also discussed.

The Storage of Almonds by the California Woodpecker. By Claude Gignoux.—A further contribution to the same subject.

The Flock Behavior of the Coast Bush-Tit. By R. C. Miller.

Genera and Species. By Richard C. McGregor.—Endorses views of W. Stone in 'Science.'

A Synopsis of California's Fossil Birds. By Loye Miller.

The Oologist. XXXVIII, No. 7. July 1, 1921.

Along the Mason and Dixon Line. By Gerard A. Abbott.—Breeding Birds about Louisville, Ky. The nesting of the Mourning Warbler in this Carolinian locality described in some detail must surely be based upon a misidentification of the nest. The bird, a notably late migrant, could easily have been present where some other species was nesting.

Carquinez Straits, California, Notes. By E. A. Stoner.

Notes on Birds Observed in Lowndes Co., Ala. By P. A. Brannon.

The Ibis. (II Series.) III, No. 3. July, 1921.

Field Notes on the Birds of Lower Egypt. By W. Raw. (continued)

First Impressions of Tunisia and Algeria. By D. A. Bannerman—One of those admirable narrative accounts of the country and its bird life which mean so much more to the reader than the ordinary "annotated list."

Notes on the Birds of Alderney. By W. R. Thompson.

Notes on Birds in South Russia. By J. N. Kennedy.

On the Correct Name of D'Aubenton's "Manucode a Bouquets." By Lord Rothschild.—*Diphyllodes magnifica* (Pennant), 1781, is correct.

Results of a Study of Bird Migration by the Marking Method. By A. Landsborough Thomson.—An account of the results of the Aberdeen University Bird Migration Inquiry which began in 1909, with a detailed analysis of the records of nine species and shorter reports on a number of others. There is also included an historical survey of bird-marking.

Some Thoughts on Subspecies and Evolution. By Col. R. Meinertzhagen.—An excellent explanation of the origin and nature of subspecies. The author believes that intergradation (i. e. geographic) is not necessary to constitute a form or subspecies since certain island birds are "obviously"

only geographic races (i. e. subspecies). It might be added that it is to cover just such cases that Americans, at least, admit intergradation by overlapping of characters. He also believes that subspecies are produced by the effect of environment and will when isolated eventually become species. He cites in his discussion Beebe's experiments with doves to show the instability of subspecific color characters but overlooks Prof. Sumner's experiments with *Peromyscus* pointing to the permanency of such characters in these mice, a point that would have strengthened his position. In all of his conclusions we heartily agree.

There are obituary notices of Col. H. Wardlaw Ramsay, H. M. Upshur and John Burroughs.

Bulletin of the British Ornithologists' Club. CCLXI July 5, 1921

A number of new forms of African birds and one from Burma are described.

Lord Rothschild describes a new Bird of Paradise, *Paradisaea apoda subintermedia* (p. 138) exact range not known, making seven races of the species *apoda* as he understands them. Dr. Percy R. Lowe, describes *Oceanites gracilis galapagoensis* (p. 140), from Charles Island, Galapagoes and *Puffinus puffinus mauritanicus* (p. 140), from Algeria.

An account of the ninth oological dinner is appended.

British Birds. XV, No. 2. July 1, 1921.

A Ringed Plover's "Nests." By T. Leslie Smith.—Remarkable photographs of the bird dogging a new nest and rolling the eggs into it when the drifting sand has covered the original nest.

Diving Ducks. Some Notes on their Habits and Courtship. By Charles E. Alford.—Interesting observations in western Canada.

Manx Ornithological Notes, 1920. By P. G. Ralfe.

British Birds. XV, No. 3. August 1, 1921.

Notes on the Little Tern and Young. By J. N. Douglas Smith.—An illustrated account of the breeding habits of the species.

British Birds. XV, No. 4. September 1, 1921.

Some Breeding Habits of the Sparrow Hawk. III. By J. Howen. Varieties of the Common Gannet. By Henry Balfour.—An albino and one with black eyes.

The Avicultural Magazine. XII, No. 8. August, 1921.

Birds in the Park at Cleres. By J. Delacour.

Both this and the July issue contain many notes on various birds in captivity, including *Hapaloderma narina*, *Spizixus canifrons*, *Sturnia nemoricola*, *Tarsiger stellatus*, etc.

The Emu. XXI, Part I. July, 1921.

Notes on Two New Birds. By A. H. Chisholm.—*Atrichornis* and *Pachycephala olivacea macphersonianus*.

The Satin Bower Bird.—Some Observations. By E. Nubling.—Description and photographs of the bower.

The Genus *Climacteris*. By F. E. Howe.—Critical review of the species and subspecies with notes on their habits, etc.

A South Coastal Selborne. By H. V. Edwards.—An area of four miles square under observation for six years yields 162 species. This is considered a rather large number for so small a tract but it could be exceeded at almost any locality in the eastern United States.

Variations in the Black-backed Magpie (*Gymnorhina tibicen*). By C. F. Coie.

There is also a note on the actions of the Mallee Fowl in captivity. A temperature of 85 to 96 was found to be necessary to hatch the eggs in the mound.

Another note is accompanied by a photograph showing a tree toad devouring a small bird.

'The Emu' with this issue takes on a new "plumage" appearing in a pale blue-green cover ornamented with a half-tone of the bird whose name it bears.

The South Australian Ornithologist. VI, Part 3. July 1, 1921.

Contains numerous local notes and the proceedings of the South Australian Ornithological Society.

The Austral Avian Record. IV, No. 6. August 1, 1921.

Additions and Corrections to my List of the Birds of Australia, 1913, and Check-List Part I, 1920. By G. M. Mathews.—Contains several new names.

Notes of Interest. By G. M. Mathews and Tom Iredale.—Discusses numerous neglected works and suggests a number of apparently necessary changes in nomenclature. Some North American birds are affected as, *Larus leucopterus* which becomes *L. glaucoides* Mayer, and *L. franklini* which becomes *L. pipizcan* Wagler.

Revue Francaise d'Ornithologie. Vol. 13, No. 146. June 7, 1921.

Contribution to a Study of the Mediterranean Forms of the Peregrine Falcon. By L. Lowanden. [In French.]

Dr. Millet Horsan's guide to the commoner birds of Africa is continued.

Revue Francaise d'Ornithologie. Vol. 13, No. 147. July 7, 1921.

The Ornithological Society of France. By A. Menegaux.—Founded May 29, 1921, with 120 members, Dr. Menegaux being the president and J. Rapine the secretary.

Birds of the Gulf of Mamara and the environs of Rabat. By F. R. C. Jourdain.

L'Oiseau. II, No. 6. June, 1921. [In French.]

Apoplexy and Diarrhoea in Birds. By A. Decoux.

L'Oiseau. II, No. 8. Aug., 1921.

Breeding in Captivity of the Hemipode Turnix tanki. By D. Seth Smith.

A Small Collection of Birds of Chile. By A. Fellay.

NOTES AND NEWS

THE admirable work being done by the National Association of Audubon Societies is familiar, in a general way, to most of the members of the A. O. U., but the work is today so varied and far reaching that much of it is not fully appreciated. One of the most important features of the Association's activity is the educational work accomplished through the Junior Audubon Classes.

Eleven years ago Mr. T. Gilbert Pearson, now president of the Association, conceived the idea of organizing children into "Audubon" Classes on a large scale, and supplying them material, double the value of what their fees would amount to. He induced Mrs. Russel Sage to give \$5,000 a year for three years in order that the plan might be tried out. Later others were interested, especially one anonymous contributor who for many years past has provided \$20,000 annually for carrying on the work. The Clubs or classes are organized chiefly in the schools and each teacher who succeeds in forming a club of twenty-five or more receives a free subscription to 'Bird-Lore' for one year.

In exchange for a ten cent fee each child receives a series of Educational Leaflets with colored pictures of birds, and an Audubon button. The children are taught that all useful wild birds and their nests and eggs should be protected. They are taught also to make bird-boxes in the schools and erect them for the use of hole-nesting birds. In this way there have been built and erected, as many as 175,000 bird boxes in one year. Entertainments, consisting of songs, plays, and recitations about birds, are given by hundreds of Junior Audubon Classes throughout the country. In the winter the children are taught to feed the birds by tying suet to the limbs of trees and scattering crumbs, seeds and broken grain where the birds can get them. The extent of the children's activities depends only upon the interest and resourcefulness of the teachers heading the clubs.

Since the work began eleven years ago 66,709 Junior Clubs have been formed, with a total membership of 1,676,743, while during the year which closed June 1, 1921, 5,851 clubs were enrolled with 229,787 children as members. These Clubs were organized in every State in the Union and many of the Provinces of Canada. Unfortunately the funds at the disposal of the Association were not sufficient to furnish material for all applicants and during the past two years the fees of many thousands of disappointed children have had to be returned. Within the past few weeks matters have taken a turn which will make it possible during the coming year to have material sufficient to supply at least 300,000 children. This is due to an increased number of subscribers to the undertaking and to a decrease in the cost of paper.

Many of the State Audubon Societies and local Bird Clubs give this work their hearty support. Some have contributed financially and some send representatives into the schools to assist in carrying on the work of instruction, which is also done by the regular agents of the Association. During the past year Mrs. Mary S. Sage, field agent for Long Island, worked in more than 100 communities, giving in all, 206 lectures to audiences aggregating more than 20,000, while Messrs. Forbush and Packard and Dr. Eugene Swope rendered similar service.

The public press during the past year has contained hundreds of notices of the organization and activities of these Junior Clubs. This elementary instruction in bird-study besides educating the coming generation in the principles of conservation, constitutes probably the most extensive scheme for developing an interest in natural history among the children, that has ever been attempted in any country.

Another important result of the work is the development of ornithologists. It is hardly conceivable that among the thousands of children who are made acquainted with wild bird life there will not be many who will continue the study of birds throughout their life, becoming competent observers of bird migration, intelligent bird banders and members of the American Ornithologists' Union.

WILLIAM JAMES BENNETTS, an Associate of the Union since 1901, died at the Washington Sanitarium, Takoma Park, Md., Sept. 13, 1920. He was born at Cornwall, England, May 20, 1865, and when four years of age came to America with his parents who took up their residence at Port Perry, Ontario. His early education was received in the public schools of Ontario and later he attended the University of Toronto. In 1890 he settled in Milwaukee, Wis., and while there became Secretary of the Natural History Society of that city. In 1902 he moved to Washington, D. C., where he was employed in the Navy Department, in charge of the mechanical section in the Bureau of Construction and Repair. Mr. Bennetts was much interested in birds, had a library of ornithological works, and in addition to his membership in the Union he was a member of the Biological Society of Washington. He is survived by his widow, a son and a daughter.—T. S. P.

OWING to conditions beyond the control of the editor and publisher, 'The Auk' is again delayed. We deeply regret this fact but hope to bring the publication up to date early in the ensuing year.

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ERRATA

Page 157, line 7, for 1879 read 1878.

- " 157, " 8, insert after Curator of, crustacea and mollusca in.
- " 323, " 29, for they would read would they.
- " " 31, for it would read would it.
- " " 34, after log insert a ?
- " 434, " 23, for *trunneus*, read *brunneus*.
- " 465, " 15, for Greatcatcher, read Gnatcatcher.
- " 475, " 46, for V read IV.
- " 479, " 9, for White read Mute.
- " 493, " 42, for 1900 read 1890.
- " 579, " 3, for *stejnegeri* read *stejnegeri*.

DATES OF PUBLICATION

- Vol. XXXVII, No. 4—October 15, 1920.
- " XXXVIII, No. 1—January 18, 1921.
- " XXXVIII, No. 2—April 15, 1921.
- " XXXVIII, No. 3—October 5, 1921.

THE AUK

A Quarterly Journal of Ornithology

ORGAN OF THE AMERICAN ORNITHOLOGISTS' UNION

Edited by Dr. Witmer Stone

ACADEMY OF NATURAL SCIENCES, LOGAN CIRCLE,
PHILADELPHIA, PA.

To whom all articles and communications intended for publication and all books and publications for review should be sent.

Manuscripts for leading articles must await their turn for publication if others are already on file, but they must be in the editor's hands at least six weeks before the date of issue of the number for which they are intended, and manuscripts for 'General Notes,' 'Recent Literature,' etc., not later than the first of the month preceding the date of issue of the number in which it is desired they shall appear.

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THE OFFICE OF PUBLICATION

8 WEST KING STREET, LANCASTER, PA.

Subscriptions may also be sent to the Editor, ACADEMY OF NATURAL SCIENCES, Logan Circle, Philadelphia. Foreign Subscribers may secure 'The Auk' through Witherby & Co., 326 High Holborn, London, W. C.

Subscription, \$4.00 a year. Single numbers, one dollar.

Free to Honorary Fellows, and to Fellows, Members, and Associates of the A. O. U., not in arrears for dues.

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2	1884, Sept. 30-Oct. 2	2d New York	16	143
3	1885, Nov. 17-18	3d New York	16	201
4	1886, Nov. 16-18	1st Washington	20	251
5	1887, Oct. 11-13	1st Boston	17	284
6	1888, Nov. 13-15	2d Washington	20	298
7	1889, Nov. 12-15	4th New York	20	400
8	1890, Nov. 18-20	3d Washington	20	465
9	1891, Nov. 17-19	5th New York	14	493
10	1892, Nov. 15-17	4th Washington	20	557
11	1893, Nov. 20-23	2d Cambridge	17	582
12	1894, Nov. 12-15	6th New York	15	616
13	1895, Nov. 11-14	5th Washington	19	667
14	1896, Nov. 9-12	3d Cambridge	14	673
15	1897, Nov. 8-11	7th New York	18	679
16	1898, Nov. 14-17	6th Washington	21	695
17	1899, Nov. 13-16	1st Philadelphia	16	744
18	1900, Nov. 12-15	4th Cambridge	19	748
19	1901, Nov. 11-14	8th New York	18	738
20	1902, Nov. 17-20	7th Washington	25	753
20a	1903, May 15-16	1st San Francisco	7	—
21	1903, Nov. 16-19	2d Philadelphia	19	775
22	1904, Nov. 28-Dec. 1	5th Cambridge	17	808
23	1905, Nov. 13-16	9th New York	17	860
24	1906, Nov. 12-15	8th Washington	24	750
25	1907, Dec. 9-12	3d Philadelphia	20	850
26	1908, Nov. 16-19	6th Cambridge	17	888
27	1909, Dec. 6-9	10th New York	19	866
28	1910, Nov. 14-17	9th Washington	23	897
29	1911, Nov. 13-16	4th Philadelphia	18	887
30	1912, Nov. 11-14	7th Cambridge	18	929
31	1913, Nov. 10-13	11th New York	28	992
32	1914, Apr. 6-9	10th Washington	27	1101
33	1915, May 17-20	2d San Francisco	11	1156
34	1916, Nov. 13-16	5th Philadelphia	26	830
35	1917, Nov. 12-15	8th Cambridge	21	891
36	1918, Nov. 11	12th New York	14	953
37	1919, Nov. 10-13	13th New York	28	1024
38	1920, Nov. 8-11	11th Washington	25	1142
39	1921, Nov. 7-10	6th Philadelphia	25	1352

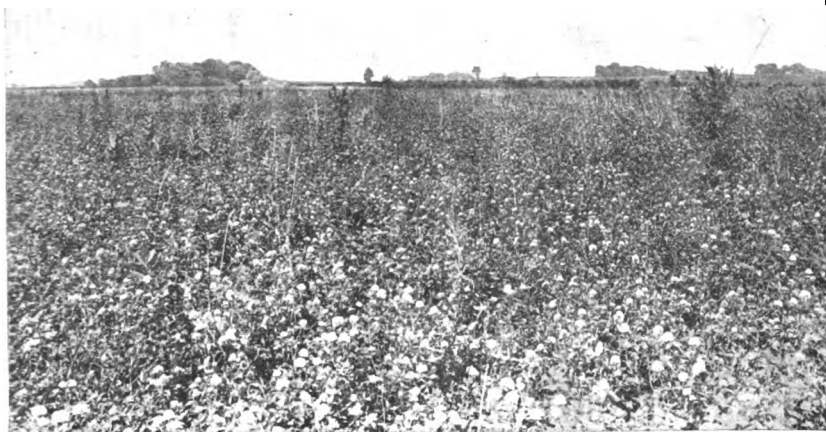
The next regular meeting—the 40th Stated—will be held at Chicago, Ill., October, 1922.



NESTS OF THE DICKCISSEL.

(a) South of Galatin, Illinois. June 6, 1907. Five Eggs.

(b) Atwood, Douglas Co., Illinois. August 12, 1918. Four Eggs.



HABITATS OF THE DICKCISSEL.

- (a) Clover Field on a Middle West Prairie. Near Lincoln, Logan Co., Illinois. July 16, 1907.
(b) Timothy Field. Near Benton, Franklin Co., Illinois. June 4, 1907.



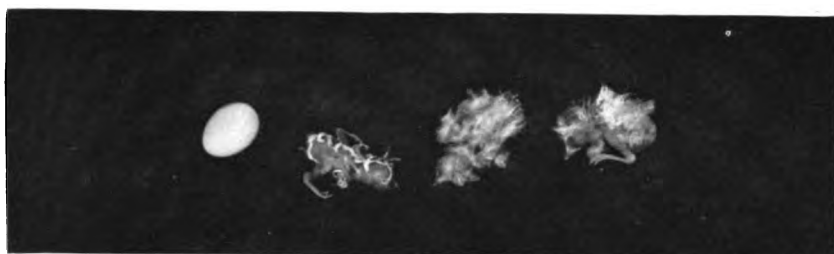
NESTS OF THE DICKCISSEL.

- (a) Centralia, Marion Co., Illinois. July 15, 1909. Five Eggs.
(b) Atwood, Douglas Co., Illinois. July 2, 1918. Four Eggs.



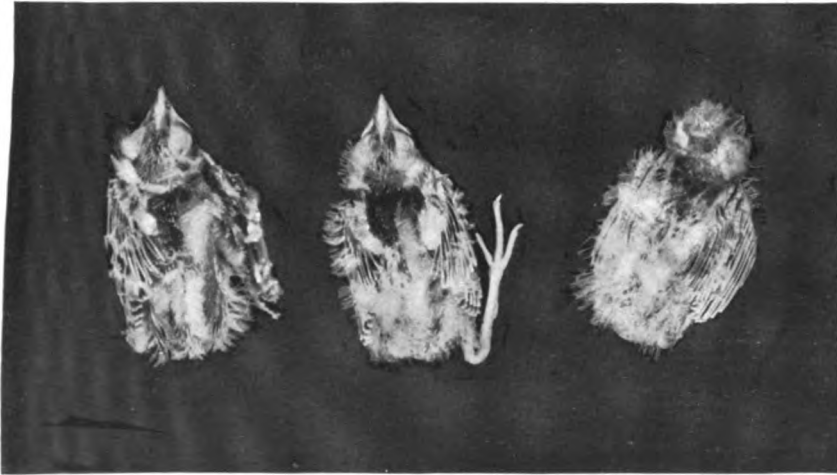
NESTS OF THE DICKCISSEL.

- (a) Atwood, Douglas Co., Illinois. July 17, 1918. One Egg Hatching.
(b) Atwood, Douglas Co., Illinois. July 25, 1918. Three Young, Two Four Days Old and One Three Days Old.



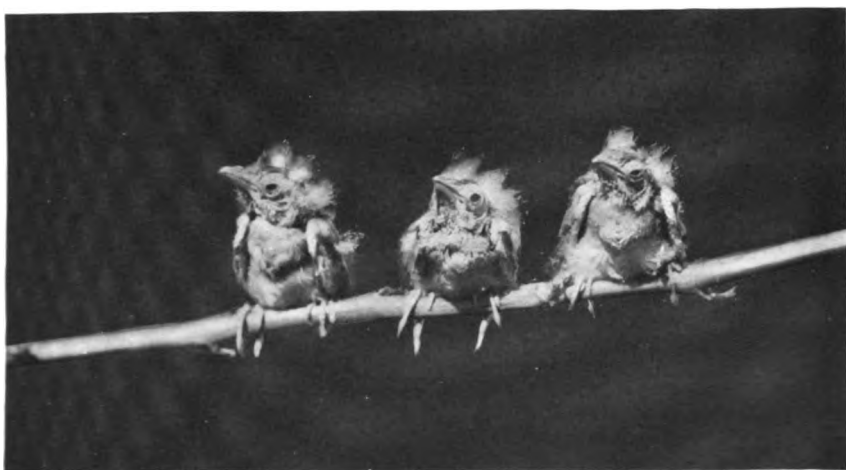
A BROOD OF YOUNG DICKCISSELS.

- (a). Sterile Egg; One Young a Few Hours Old; Two Young One Day Old.
- (b). One and Two Days Old.
- (c). Three and Four Days Old.
- (d). Another Brood Two Days Old with Natal Down at its Best.



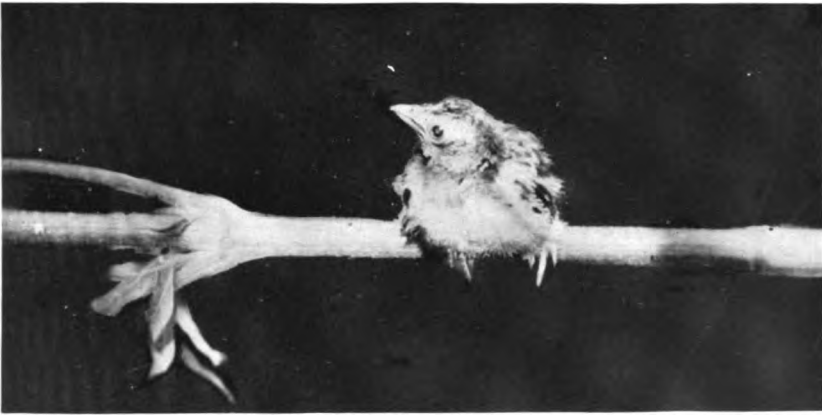
A BROOD OF YOUNG DICKCISSELS.

- (a). Sterile Egg; Young Four and Five Days Old.
- (b). Six and Seven Days Old.
- (c). Six Days Old.



A BROOD OF YOUNG DICKCISSELS.

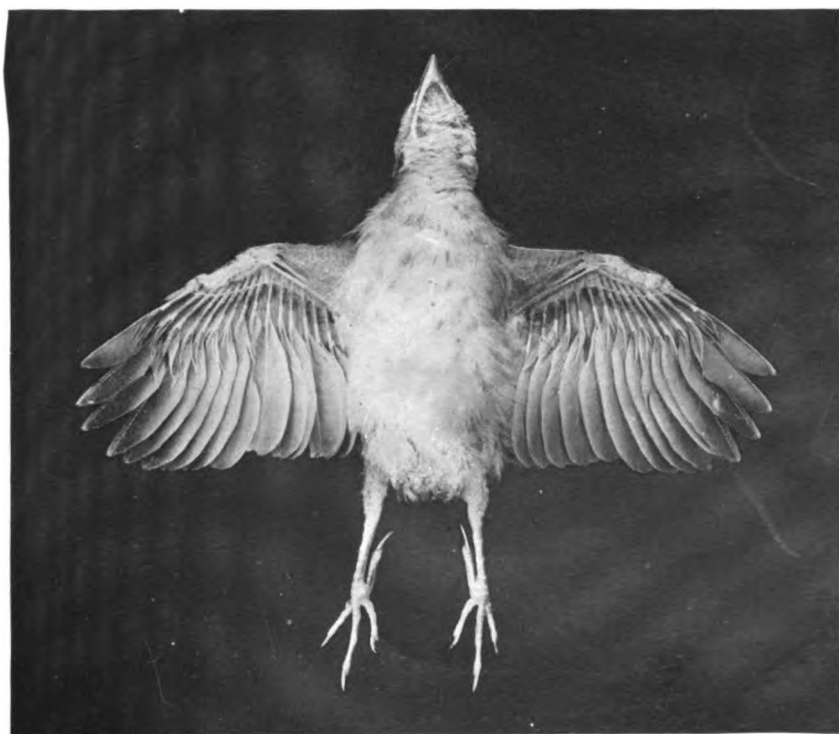
- (a). Seven and Eight Days Old.
- (b). Eight and Nine Days Old.
- (c). Ten Days Old.



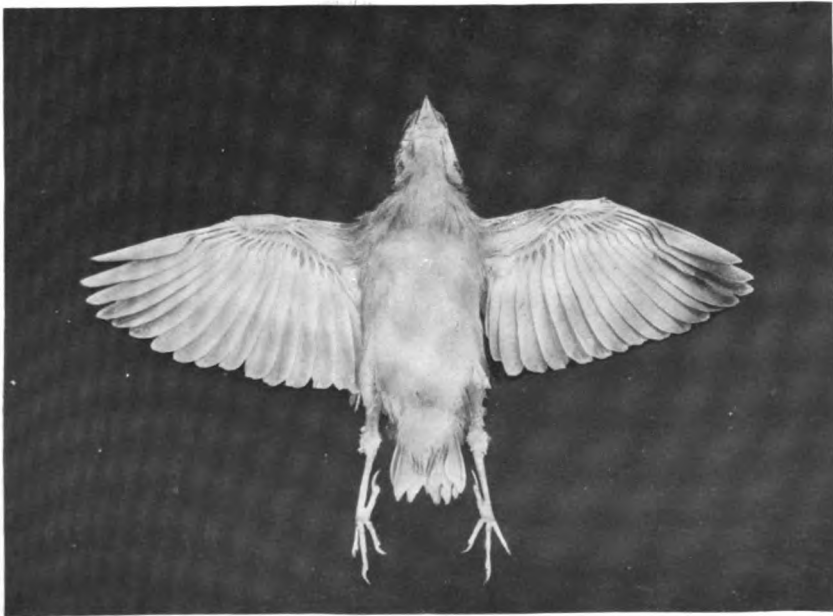
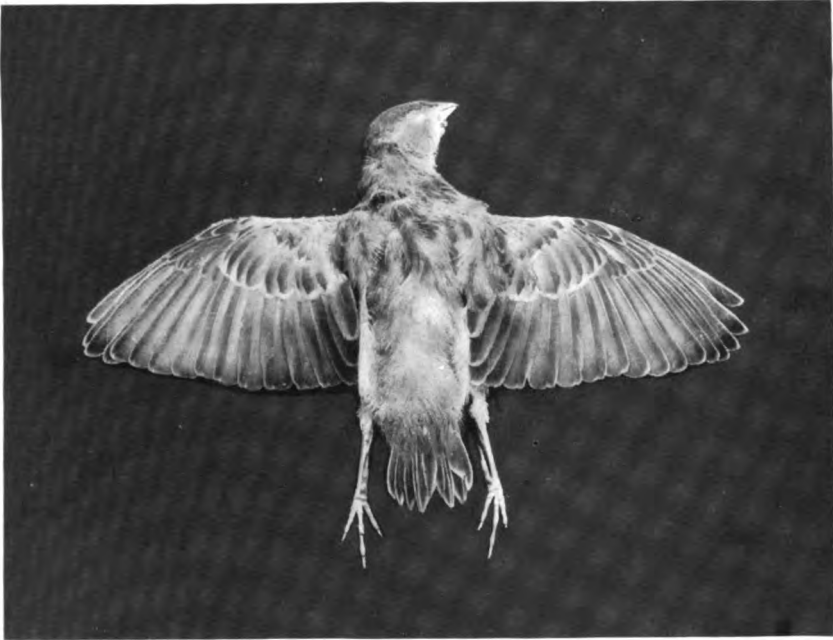
YOUNG DICKCISSEL FROM SAME BROOD.

(a) and (b). Eleven Days Old.

(c). Twelve Days Old.

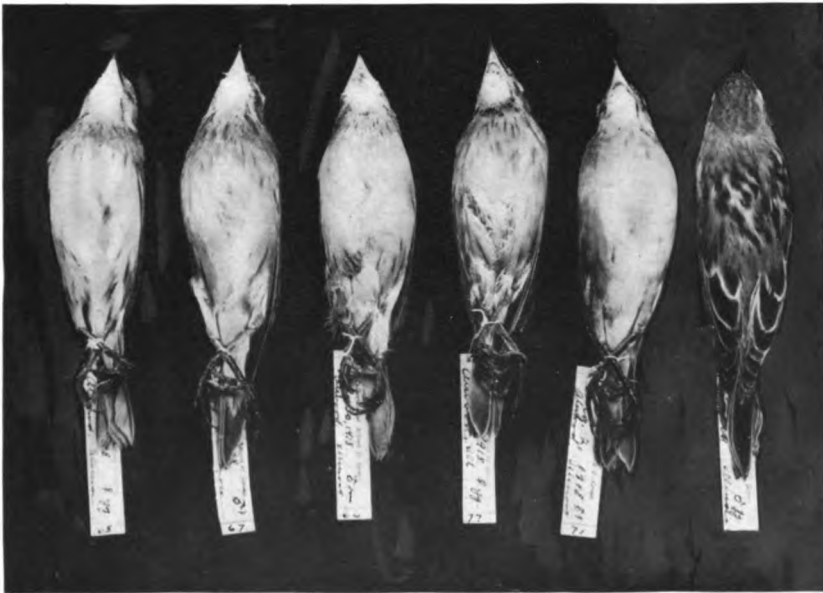
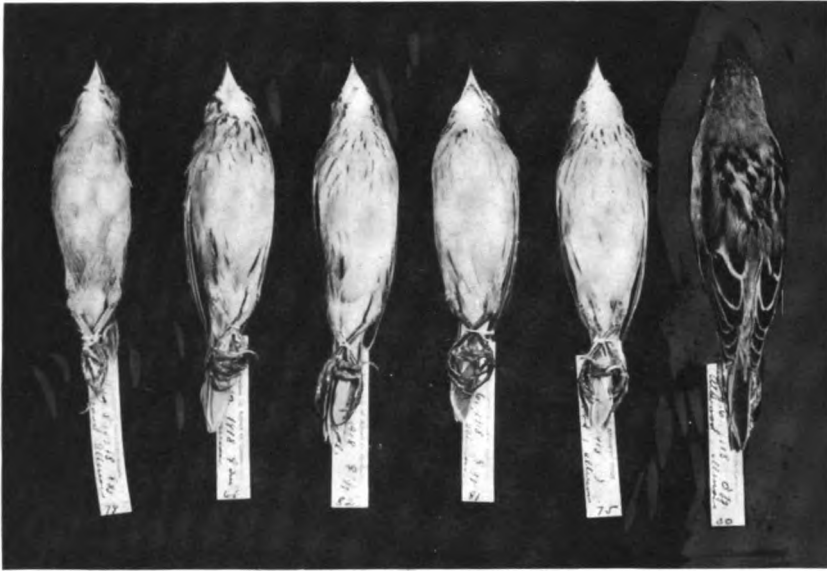


YOUNG DICKCISSEL FROM SAME BROOD.
Fourteen Days Old. (Six Days after Leaving the Nest.) Juvenal Plumage.

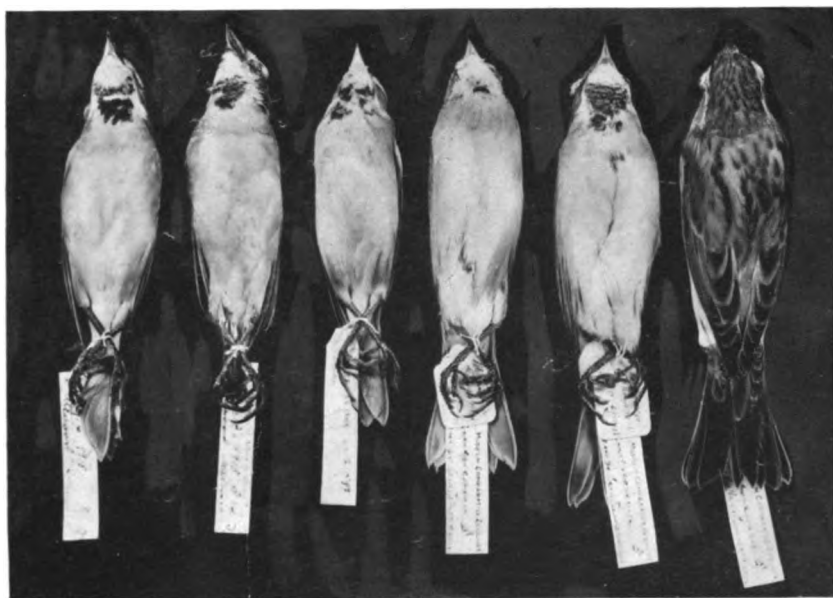
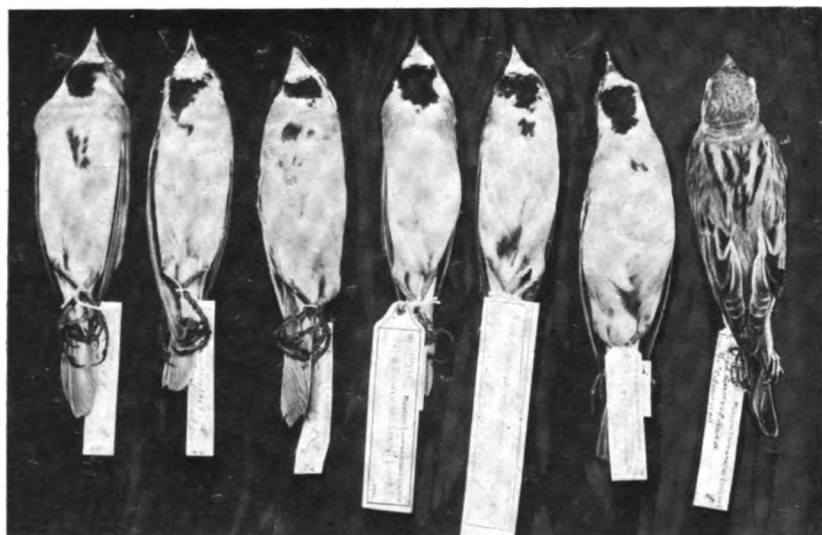


A YOUNG DICKCISSEL.

Eighteen Days Old. (Ten Days after Leaving the Nest.) Juvenal Plumage.



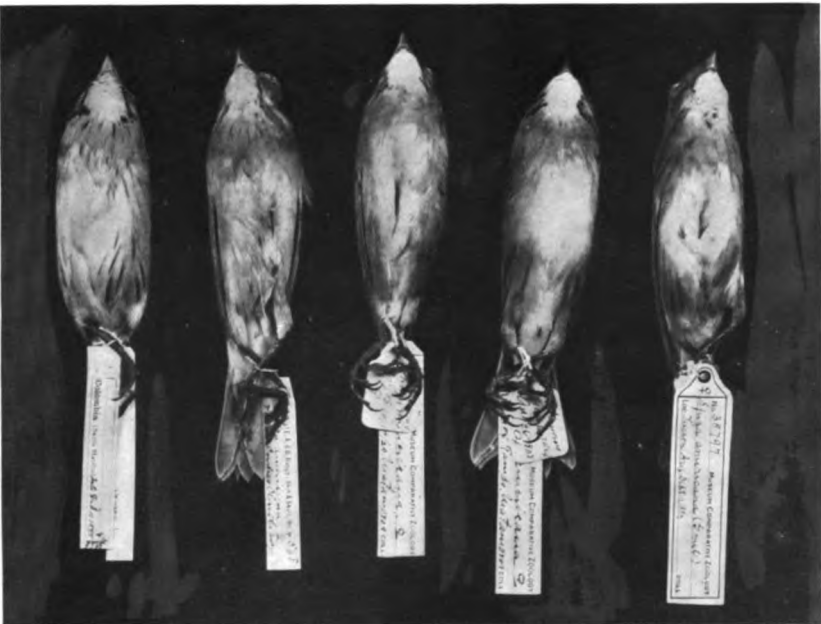
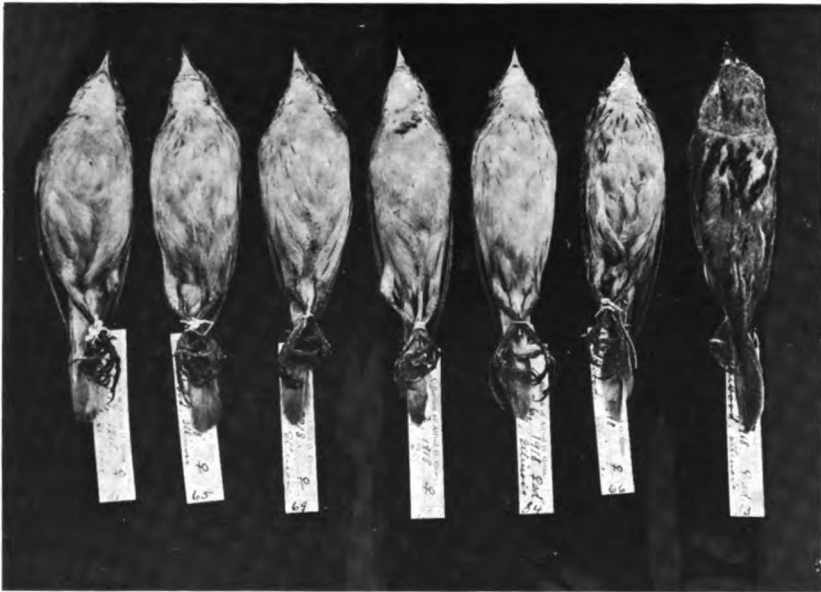
SKINS OF THE DICKCISSEL.
Showing Transition from Juvenal to First Winter Plumage.



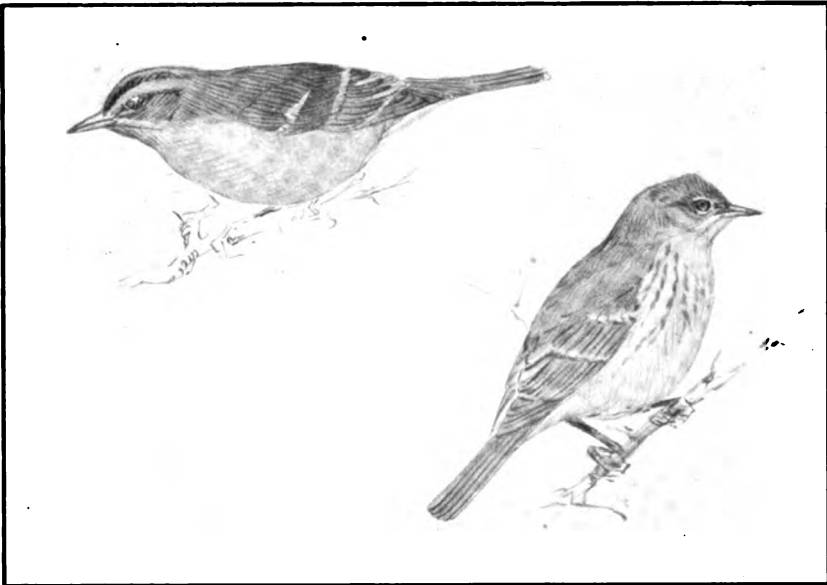
MALE DICKCISSELS.

(a). Adult Nuptial Plumage.

(b). Adult Winter Plumage.

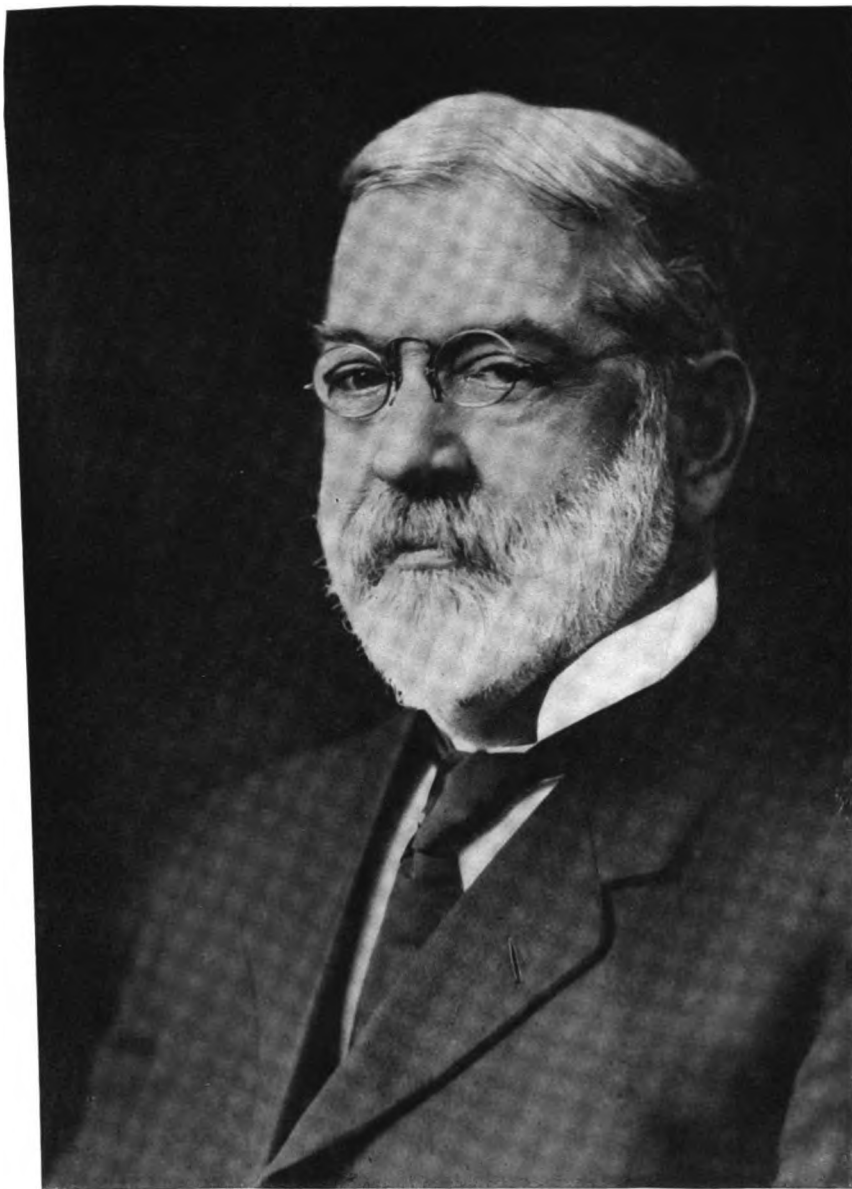


FEMALE DICKCISSELS.
(a). Adult Nuptial Plumage.
(b). Adult Winter Plumage.

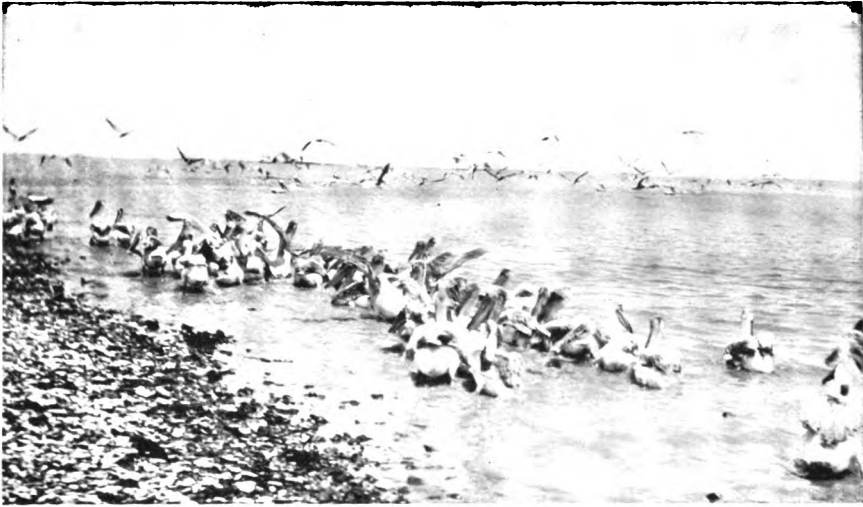


FIELD SKETCHES FROM LIFE.

Upper: The Aquatic Warbler (Left) and the Spotted Flycatcher (Right).
Lower: The Garden Warbler.



Wm. Dutcher.



1. BROWN PELICANS, OLD AND YOUNG, LEAVING DUNHAM'S ISLAND, TEXAS.
 2. YOUNG WHITE PELICANS ON NESTING GROUNDS, LITTLE BIRD ISLAND, TEXAS.
 3. A GROUND NEST OF THE REDDISH EGRET, BIG BIRD ISLAND, TEXAS.
- FROM 'BIRD-LORE.'

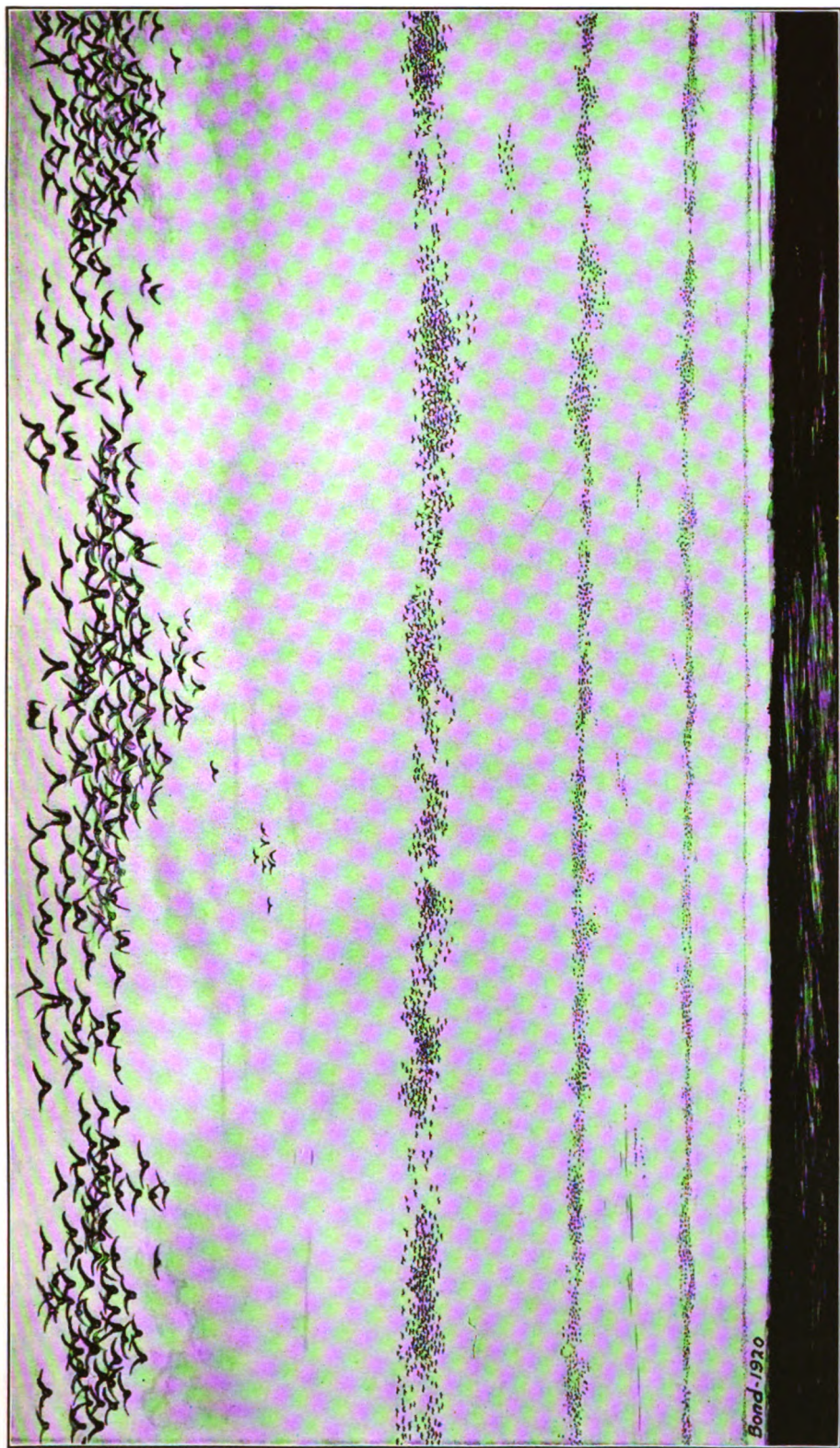


1. A CABOT'S TERN COLONY.

2. EGGS OF THE CABOT'S TERN.

3. NEST OF THE CASPIN TERN. ALL ON BIG BIRD ISLAND, TEXAS.

FROM 'BIRD-LORE.'



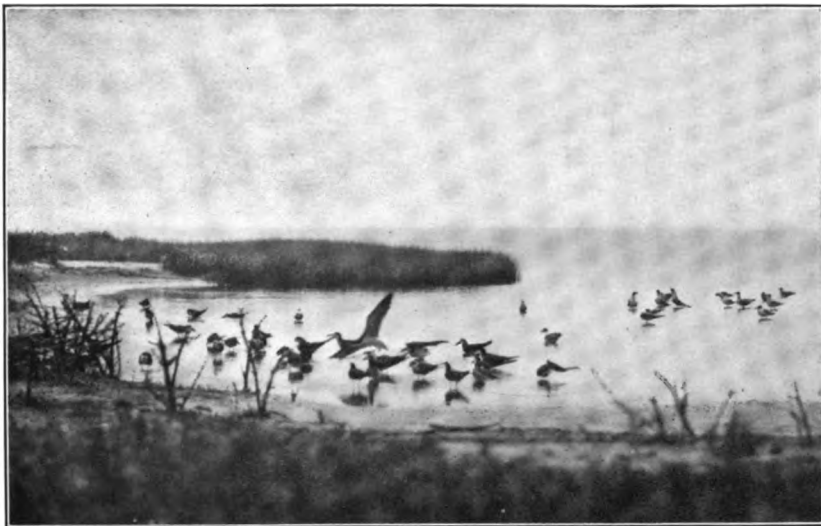
A FLIGHT OF PASSENGER PIGEONS.

FROM A PAINTING BY FRANK BOND.



**YOUNG FLICKERS AT NEST HOLE: HEAD OF ONE PROJECTING THROUGH
WING OF ANOTHER.**

From photos supplied by Zool. Mus., Univ. of Minn.



BLACK SKIMMERS (*RYNCHOPS NIGRA*).

1. Bird in center cleaving water with one mandible, not feeding.
2. Feeding on Fish on a Tidal Flat.



BLACK SKIMMERS (*RYNCHOPS NIGRA*).

1. Fishing on a Tidal Flat.
2. In Flight over the Water.

9



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